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THE

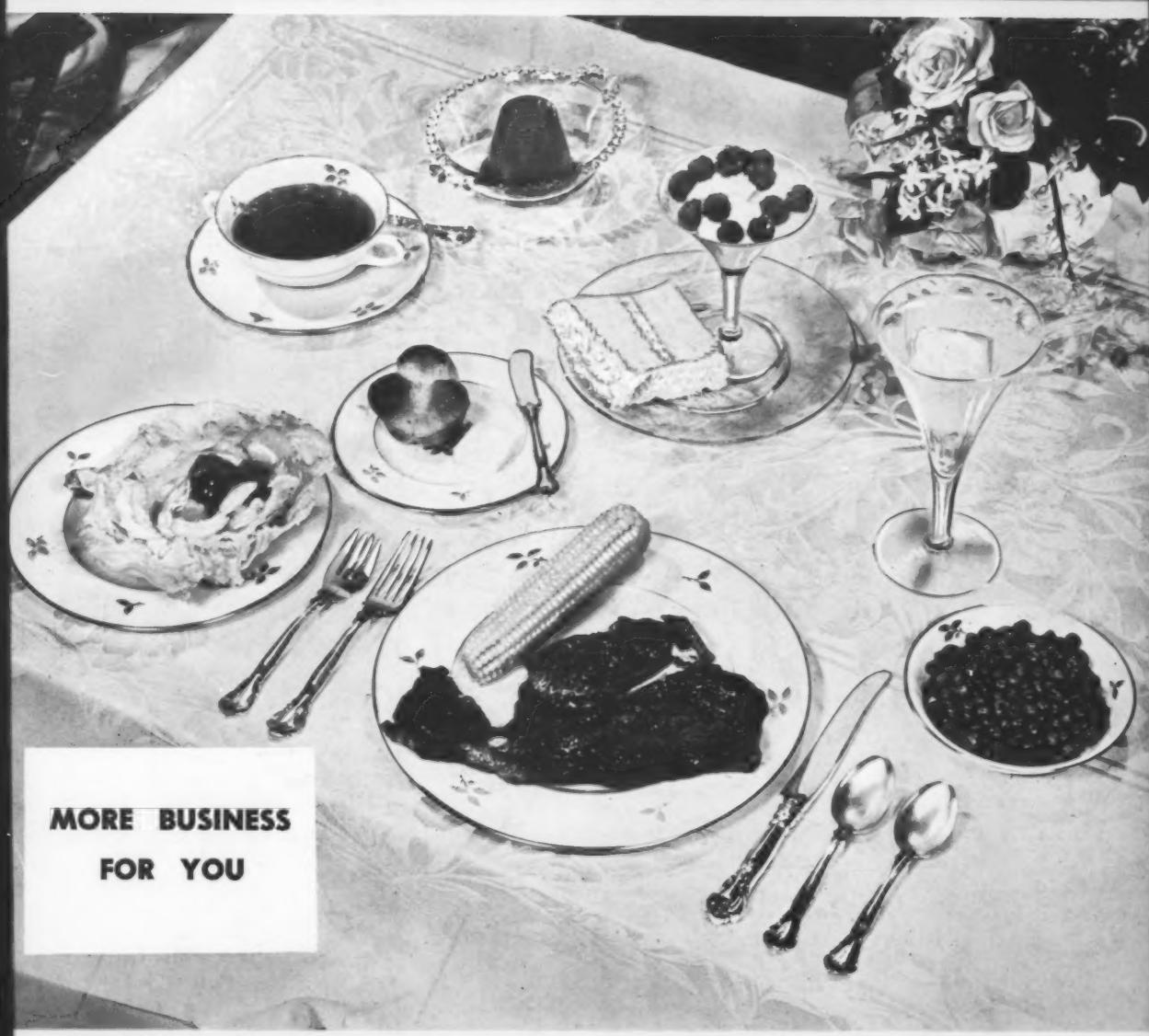
AUGUST, 1946

# Refrigeration

AIR CONDITIONING  
EQUIPMENT

## INDUSTRY

MERCHANDISING \* INSTALLATION \* MAINTENANCE



MORE BUSINESS  
FOR YOU

IN THIS ISSUE:

Profits in Produce Cooling...More on Comfort Cooling  
What Kind of Contractor Are You?...Trouble-Shooting  
Refrigeration Gets the Bird...Missing Any Good Bets?



## 50 Men from Missouri

THESE 50 people devote their full time to engineering projects aimed at making Weatherhead products *better—for less*. They have "to be shown" by scientific tests just how good a product really is. And then, they often reverse the situation and show *us* how we can *improve* the products you use.

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### ATTENTION REFRIGERATION ENGINEERS

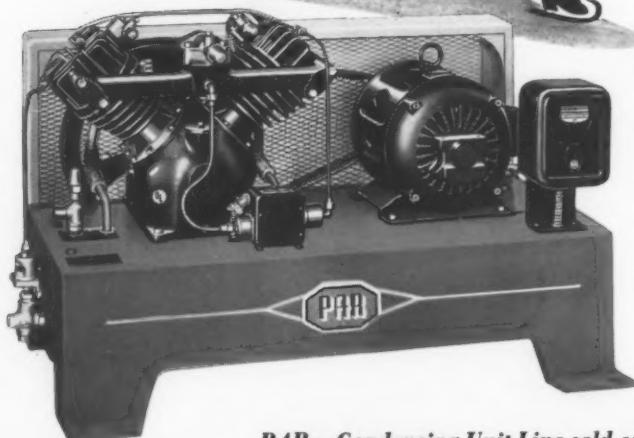
Our Valves, Dehydrators, Strainers, Manifold Assemblies, Accessories and Fittings are illustrated and described in our new catalog. Write for your copy today.

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by Comparison, they're buying PAR

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# PISTON PINS

*... accuracies in millionths!*



**BELL** **ENGINEERING**  
KNOXVILLE, TENNESSEE

# THE

# INDUSTRY

VOLUME 3, No. 8

AUGUST, 1946

THIS MAGAZINE has no official affiliation with ANY group, society or association.

THE COVER . . . Here's easier housekeeping for Mrs. America—and more business for you. This is a typical meal of frozen food, complete, delicious, convenient and easy to prepare . . . and the services of all of the refrigeration field are used in bringing it from the field to the table. (Frigidaire photo.)

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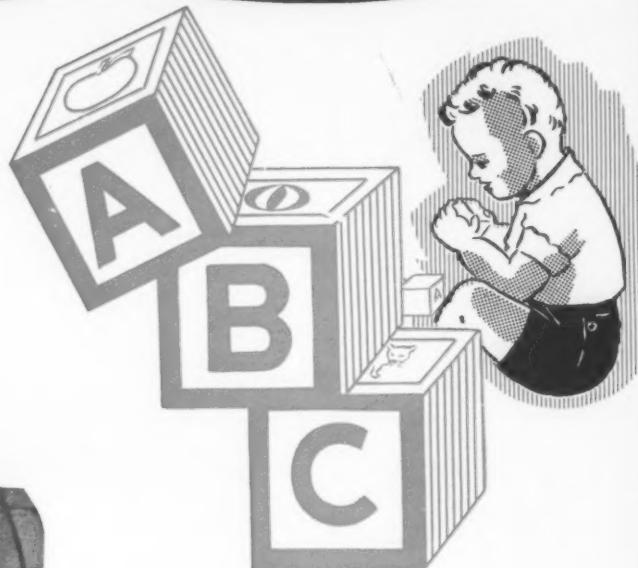
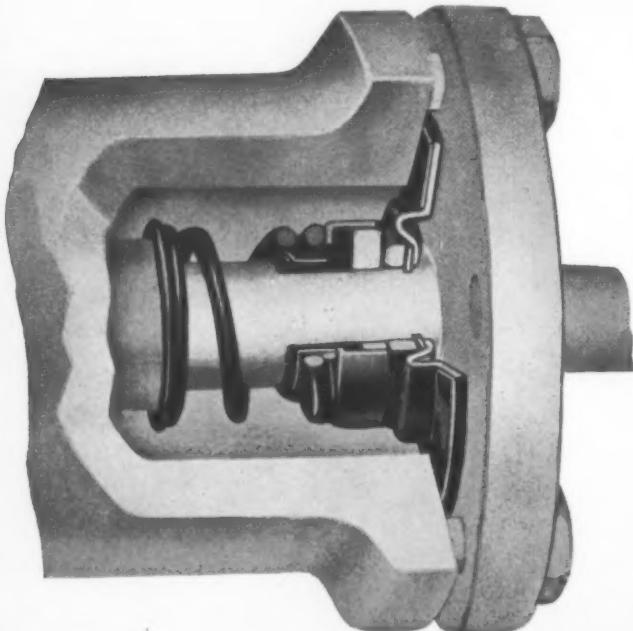
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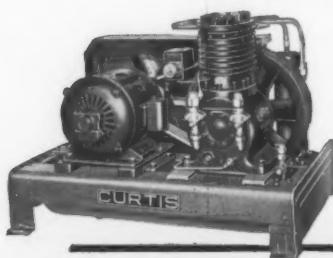




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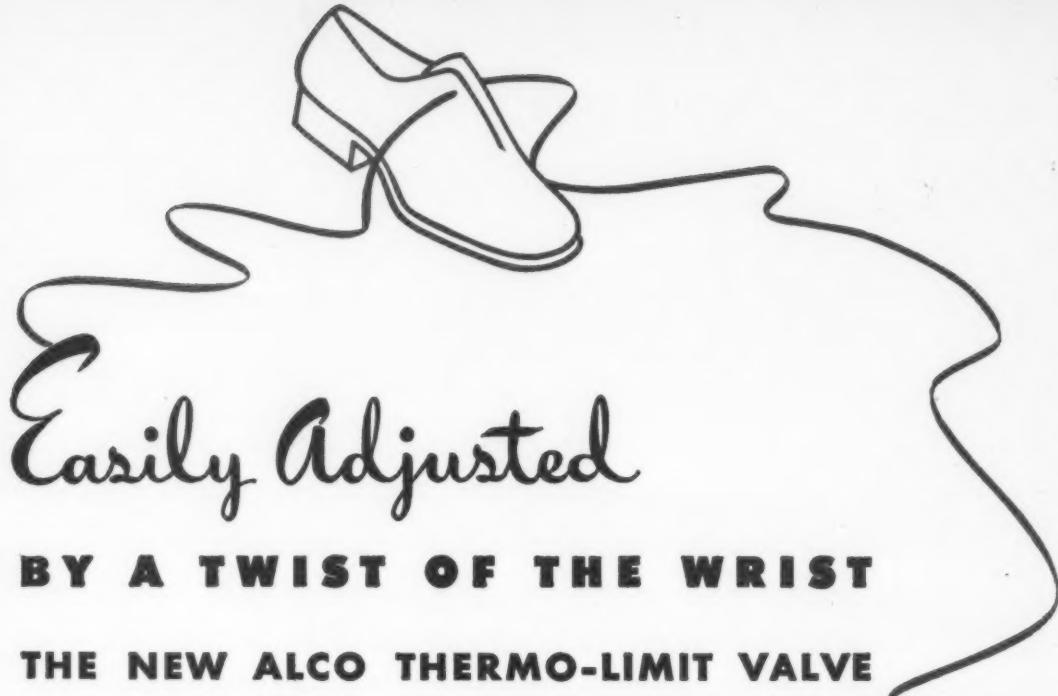
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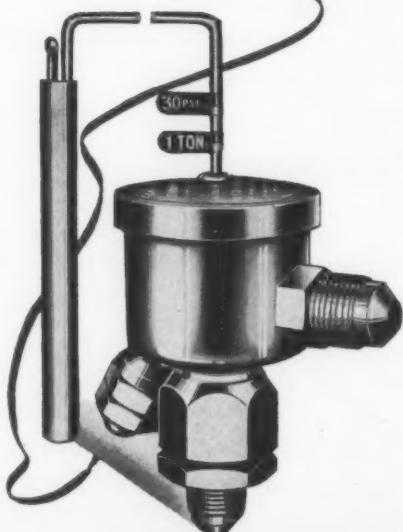
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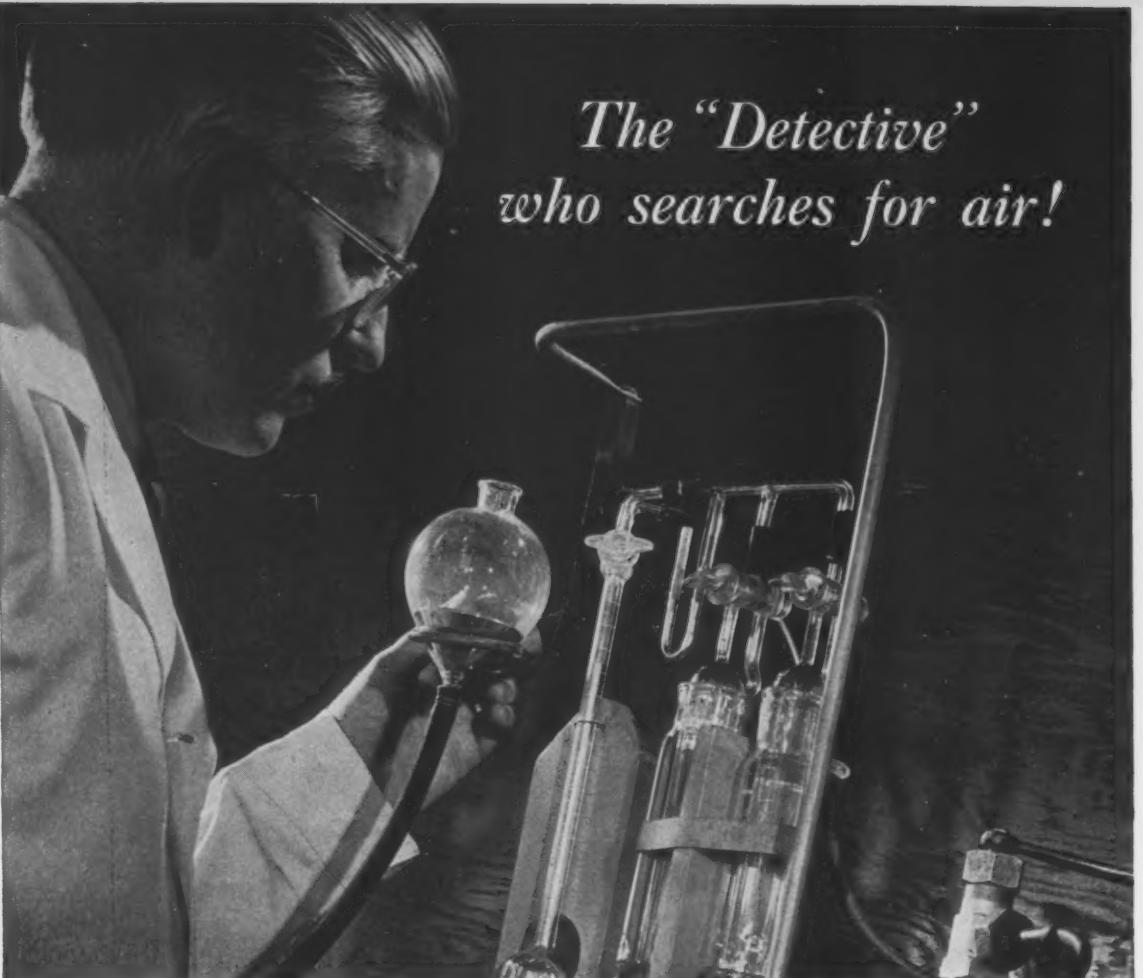
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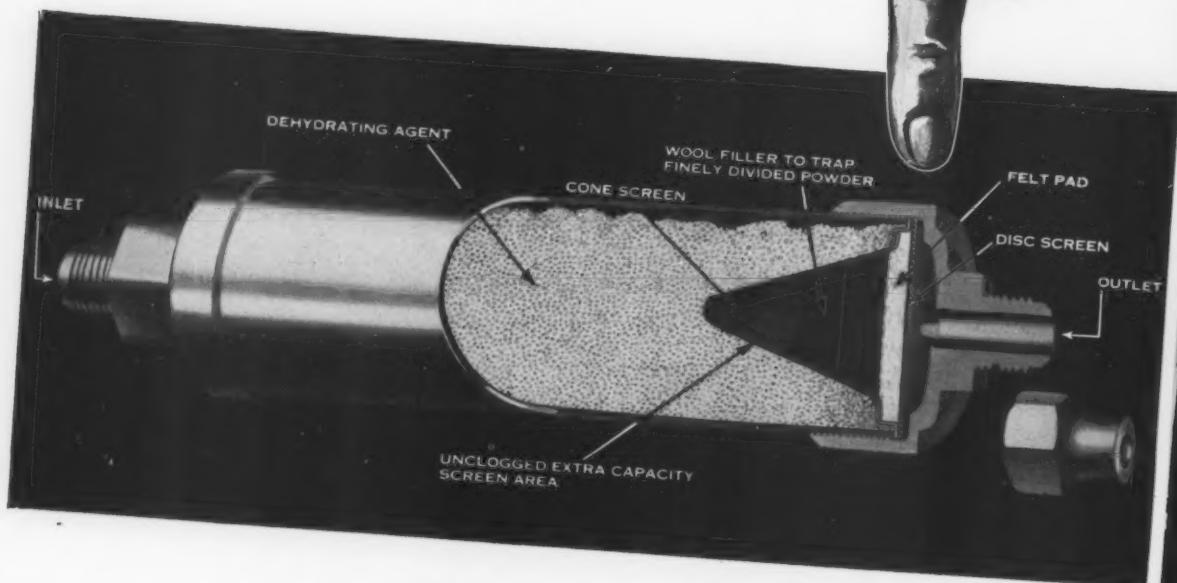
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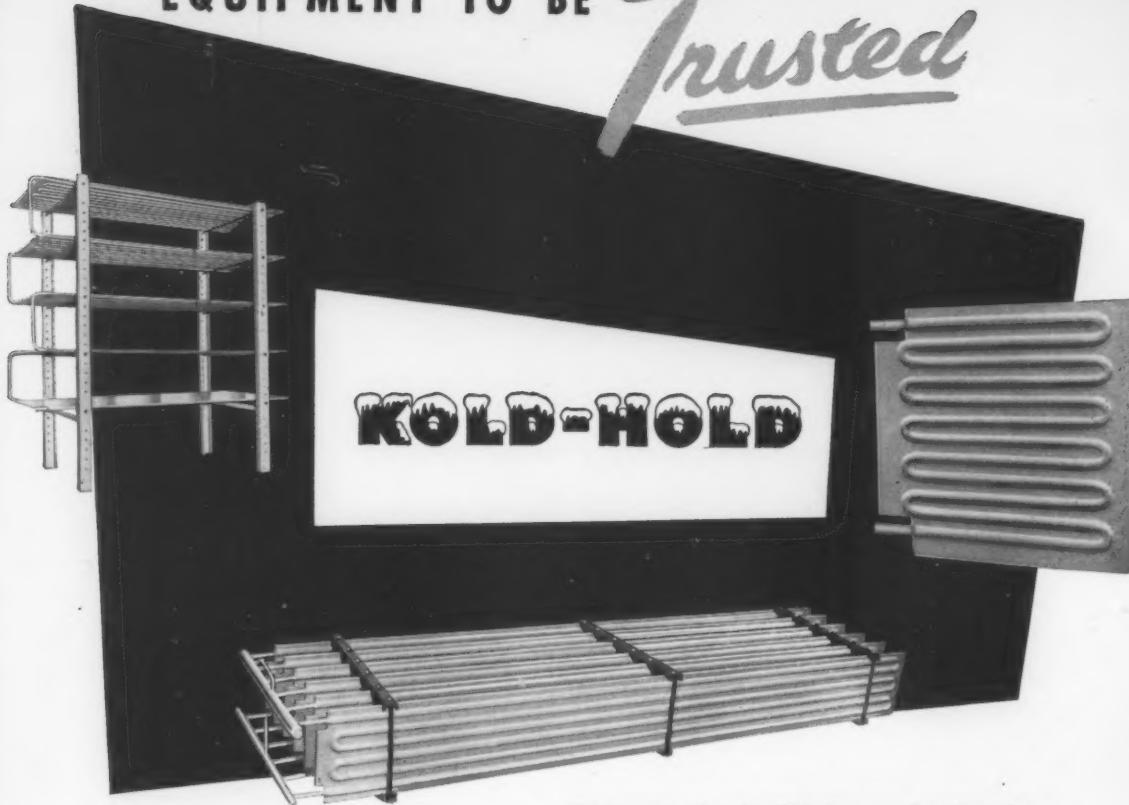


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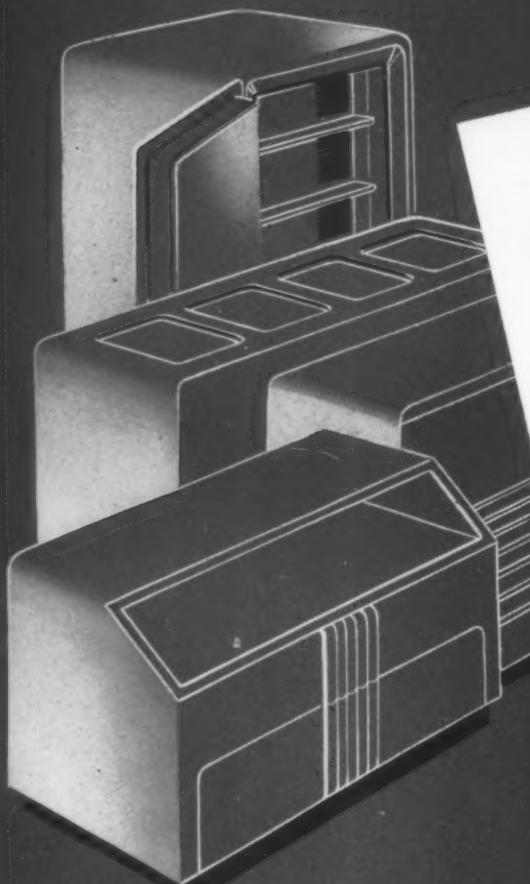
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KEROTEST VALVES and FITTINGS  
do the best job—on every job because  
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No. 897 Dura-from Thermostatic Expansion Valve for commercial applications. Compact and easy to install.



No. 793 Differential Temperature Expansion Valve specially designed for temperatures below minus 30° F.

It was pointed out in No. 9 of this series that moisture could freeze at the expansion valve in a manner to either plug the orifice or hold the needle open. It was likewise pointed out that a grain of water is a sizable quantity and sufficient to cause either type of freeze-up. It was further pointed out in No. 11 of this series that sufficient moisture to cause freeze-ups on low temperature cabinets could possibly come from the refrigerant itself. These facts emphasize the necessity of proper dehydration.

Such minute quantities of moisture are involved in some cases that it is difficult for the manufacturer to realize he has moisture trouble. Many times he is doing what he believes to be a good job of dehydration and still some of his units act as though they have moisture.

Many types of expansion valves can be opened easily in the field for the purpose of inspecting the needle and seat. Some valves have the bottom plug sealed with solder while others employ a gasket as a seal, but in either case if the valve is held firmly in a vise, the body plug can be removed by the use of the proper wrench and without heating.

When there is a doubt as to whether or not a freeze-up has occurred at the expansion valve, the following procedure can be used to absolutely determine the issue.

1. Obtain some dry ice.
2. Remove feeler bulb from suction line if valve is of the thermostatic type. (Unit operating continuously.)



FIGURE 1

3. Place a piece of dry ice firmly against the valve body as shown in Fig. 1. (Unit still operating continuously.)
4. Close liquid line valve and pump unit down.
5. Quickly remove valve from unit and seal its connections to keep moisture from condensing inside. Keep valve temperature below the freezing point of water by further cooling with the dry ice.

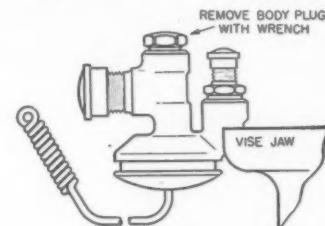


FIGURE 2

6. Place in vise as shown in Fig. 2 and quickly remove body plug.
7. Remove valve from vise, then remove needle and inspect needle and seat for presence of ice.

If a freeze-up has occurred, the ice can be seen sticking to the needle or needle carrier, or plugging the valve orifice. Remember, it takes only a small amount of moisture to cause trouble so inspect the parts closely and quickly. The ice will melt as the parts warm up, which fact helps to identify the moisture.

This method of inspection can be used only with valves that can be opened readily in the field.

**WARNING: SEAL EVAPORATOR AND LIQUID LINE CONNECTIONS ON THE UNIT IMMEDIATELY AFTER REMOVAL OF THE VALVE.**

DETROIT LUBRICATOR COMPANY Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION

## DETROIT LUBRICATOR COMPANY



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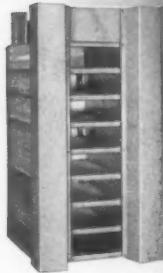
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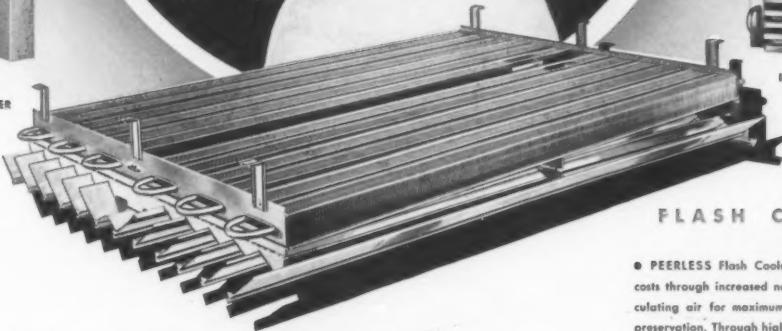
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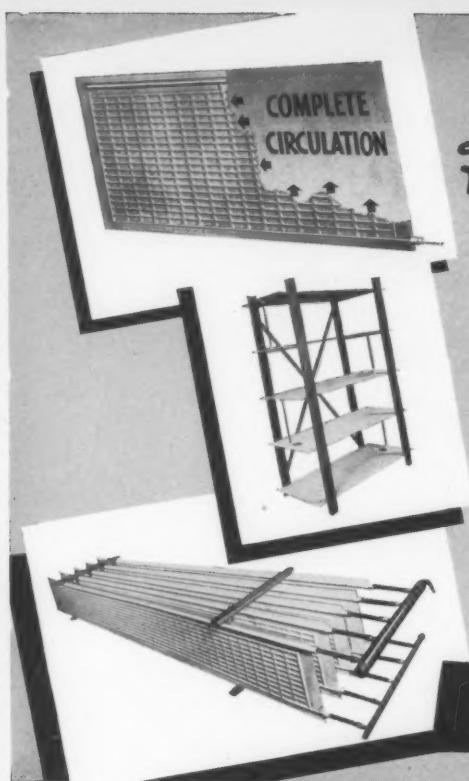
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*For Complete Surface Freezing*

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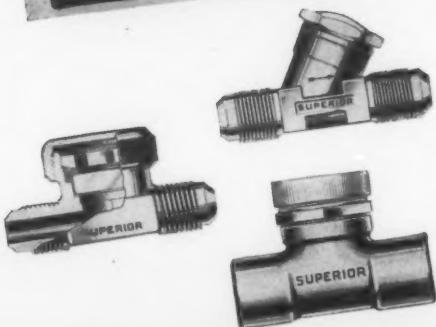
If you make, sell or use low temperature equipment such as freezer cabinets, locker plant plate banks, sharp freeze shelf stacks, etc., it will certainly pay you to get details on Hubbell-Yoder Plates. They'll step up operating efficiency and reduce operating costs. As the old darkey said, "Dat am no prophecy: dat am a fact." Write, wire or phone.



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No. 128

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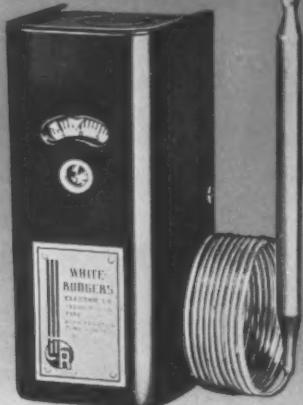


The novel design of these SUPERIOR Check Valves permits the easy removal of all internal parts—as a unit—while soldering lines to valve connections, or for subsequent inspection.

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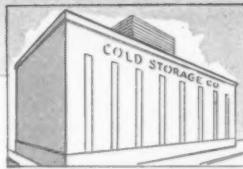
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**WHITE-RODGERS** controls are  
so flexible in application that  
**CUSTOM BUILT**  
requirements often can be  
satisfied with standard controls



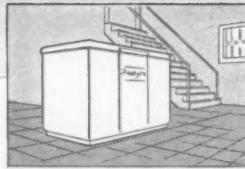
#### REFRIGERATED TRUCKS

In refrigerated trucks, as well as terminal and hold-over points, accurate temperature control is essential.



#### STORAGE WAREHOUSES

Whether for food or furs, blood plasma or bakery goods, White-Rodgers controls will fit the need.



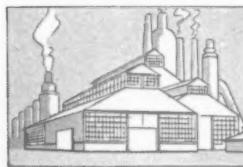
#### FOOD LOCKERS

Beverage cooling, chill bars, farm freezers, milk coolers and many others all require accurate temperature control.



#### HOMES

Built-in summer-winter air-conditioning requires the insurance of positive control that White-Rodgers controls give.



#### FACTORIES

For unit cooling, air conditioning and metal parts cooling, White-Rodgers controls assure dependability.



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Better-satisfied customers stay longer, buy more, in comfortable surroundings.



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Bottle or beer tap refrigeration, soda fountain-like all -



#### FLORIST SHOPS

... cases with  
completely  
controlled  
merchandise  
availability.



#### LOCKER PLANTS

For quick freezing of foods, as well as low-temperature storage, positive and accurate control is essential.



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Controls for Refrigeration • Heating • Air Conditioning

*The Ansul Research Staff  
REPORTS ON . . . .*

**WAX causes frozen valves too!**

# HERE'S FURTHER *Proof*

## RESULTS OF MACHINE TESTS

The equipment used consisted of 1/4 hp. motor, reciprocating compressor and dry coil with the thermostatic expansion valve located in contact with the coil.

A filter of steel wool and fine copper screen was placed in the liquid line just ahead of the expansion valve. The liquid line leading to the filter was coiled about the expansion coil to insure feeding cold liquid to the filter. The expansion valve, liquid line, filter and expansion coil were placed in a metal container and insulated with rock wool. A pentane thermometer, attached to the side of the filter, recorded temperatures which were, of course, much lower than corresponding temperatures taken in other parts of the equipment.

After the equipment had operated for four days with the filter at approximately -50 degrees F., the filter was quickly removed, dismantled and photographed while still cold. For example, Photograph A shows a considerable separation of wax. Photograph B shows a portion of this wax after removal from the filter.

**ANSUL WHOLESALERS** are ready and equipped to render an intelligent, cooperative service to refrigeration engineers and maintenance men on problems which arise from time-to-time in the operation of refrigerating systems.

### FOR EXAMPLE:

Samples of ice machine oils, submitted by users of Ansul Refrigerants to Ansul Wholesalers, are tested by Ansul laboratories without charge by the Ansul Standard Wax-Oil Separation Method. This method, developed and standardized especially for use in connection with oils used in refrigerating systems, provides an accurate determination of the amount of wax which separates from an oil at low temperatures.

\*REG. U. S. PAT. OFF.



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A—Wax separated on filter at -50° Fahrenheit



B—Wax removed from filter at -50° Fahrenheit

### REMEDIES

To eliminate the wax trouble in expansion valves and coils:

1. Use an oil which separates little or no wax from its mixture with the refrigerant at the operating temperature of the valve.
2. Install an oil trap to cut down the amount of oil (and consequent wax) circulating with the refrigerant.



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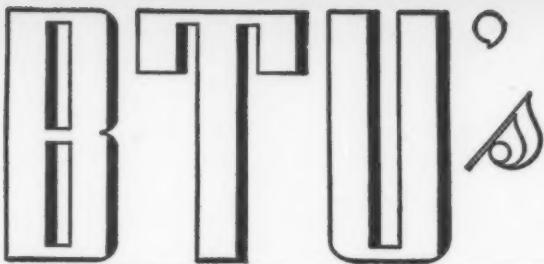
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## News • Laws • Trends

● **Console-Type Refrigerator.** One of the high points of interest in the "Post War House" which has been on exhibition in Los Angeles for about three months now is the console-type refrigerator, a specially-built model supplied by Servel. The unit, it appears, was installed primarily to get consumer reactions, and there is no thought of going into production on it in the near future, at least.

Most visitors to the Post War House seem to fancy the console refrigerator's height, their principal question having to do with the drawers which pull out to permit access to the food. Some persons seem to think that this requires a more than necessary amount of stooping, but others point out, and with some merit, that it's no harder to pull out a drawer to get at the food than it is to take out food at the front of a conventional refrigerator shelf to get at the foods stored in the back.

● **Open-Type Produce Cases.** If developments up to the present time are continued, most of the fresh vegetables sold by food stores within the next few years will be pre-packaged. This, of course, will greatly accelerate the demand for self-service type vegetable cases. In addition to greatly adding to appearance, pre-packaging cuts down waste—two major points which aggressive food merchants quickly recognize. There will probably be one switch in the present situation, however; if pre-packaging becomes a volume proposition, it won't be done by the individual stores. Rather, it will originate at the farm or at the grower's packing plant.

● **Chains and Frozen Foods.** A forecast that frozen food sales ultimately will account for at least 10 per cent of the total volume of chain food stores was made by George T. Phillips, sales manager of H. C. Bohack, Inc., Brooklyn, at a recent meeting of the Eastern Frosted Foods Association in New York City. "Frozen foods will become a very important department in every unit of a food chain organization," Mr. Phillips declared.

● **Stratosphere Freezing?** One of the recently talked-about developments in food freezing—stratosphere freezing—is not likely to come about for the present at least, believes J. M. Lambert, district manager of York Corp. Speaking before a recent meeting of the Baltimore-Washington section of ASRE, Mr. Lambert said that stratosphere freezing had been discarded as impractical for many reasons.

"The cost of flying above 15,000 feet, which is the usual maximum commercial altitude, is quite prohibitive,"

he said. To be assured of satisfactory freezing temperatures during the summer, he added, it might be necessary to climb as high as 30,000 feet. The operating penalty, he concluded, can't be offset by "other limited advantages."

● **Frozen Food Shipping Unit.** Reynolds Metals Co.'s new, specially designed all-aluminum freight container, recently displayed in Chicago for the first time, can be built to serve as a shipping container for frozen foods, maintaining a zero temperature for 36 hours without re-icing, according to W. C. McMurray, manager of the company's container division.

The new container will permit the shipment of half a carload by any means of transportation without disturbing the contents. Transfer of the unit from one form of transportation to another may be accomplished quickly without the need of an extra crew or extra equipment other than that which is an integral part of the unit.

● **Self-Service Ice Cream.** Here's another location that you can add to your list of potential uses of self-service low temperature equipment—the merchandising of ice cream. A large Midwestern super market has introduced ice cream in open self-service cases, and reports that it is moving toward becoming a profitable volume item. For customers who want to extend their shopping time before they go back home, the store offers, for an additional 2 cents, a specially made insulated bag. The low temperature self-service case, it would seem, is a "natural" for ice cream; it has visibility and keeps ice cream in perfect salable condition.

● **Watch Us Grow.** Postwar requirements for air conditioning, according to a recent report, are in excess of \$1 billion.

A late tabulation shows that more than 200 additional companies have entered the frozen food equipment field.

The USDA's 1945 count shows 6,464 frozen food locker plants in operation throughout the country, an increase of 1,182 since 1944.

More than 30% of all department stores now carry frozen foods in their grocery departments, and nearly 20% more stores plan to carry them, according to a recent survey. Retail stores now selling frozen foods number between 35,000 and 40,000.

● **What They Want.** A recent survey by the Idaho Agricultural Experiment Station of 2,000 Idaho farms where frozen storage facilities are desired discloses that walk-in and reach-in units figure just about equally in their wants. In essentially equal proportions, the farms expressed interest in:

Combination walk-in storage and freezer units sized from 75 to 300 cu. ft. and varying in cost from \$400 to \$800; 8 and 12 cu. ft. reach-in freezers; 20 to 30 cu. ft. lift-top cabinets; 35 to 75 cu. ft. reach-in storage units. Investigators found that while only about 1% of the farms covered had frozen storage facilities of their own, about 85% of them used locker plants, and would plan to *keep on using these facilities* for processing and storage of meats. However, they'd want to process and freeze their own fruits and vegetables.

# Refrigeration Gets the

Most of the fun of hunting pheasant is lost if the sportsman can't get his birds home in good condition. Here's how one lodge, operated by a refrigeration man, solves that problem

THE man who can make a hobby out of his business is to be considered fortunate; but even more fortunate is the man who can make a business out of his hobby. Such a man is Ray Kromer, Cleveland refrigeration man, who until recently was head of Oil Heating Devices, Inc., commercial refrigeration contractor firm, and who now operates as Ray Kromer, Inc., one of whose enterprises is Dakota Ring Neck Lodge, in Aberdeen, S. D., in the heart of the pheasant country.

An ardent sportsman and hunter himself, Mr. Kromer was quick to recognize from his own experience the "pull" that a complete hunting service—including good hunting, fine accommodations, transportation to the best fields for choice shooting, and most important, facilities for freezing and packing the birds for delivery back home—would have both for individual business men and organiza-

tions which might want to entertain their clients in this manner.

Being first and foremost a refrigeration man, Mr. Kromer naturally places heavy emphasis on the refrigeration facilities which he has installed at Ring Neck Lodge—but the other services which go to make up an all-inclusive hunting vacation have not been overlooked. "Hunter special" planes bring guests in from faraway points; and complete hotel services are available at the lodge, which has a staff of 30 attendants. Experienced guides take hunters to choice reserved shooting areas.

One of the biggest drawbacks to full enjoyment of small-game hunting trips can be the inability of the hunter under average circumstances to get back home in good condition much of the game he has bagged. At Ring Neck Lodge, Mr. Kromer has taken care of this problem by installing modern quick-freezing equipment,

plus facilities for packing and shipping the birds to the hunter's home in first-class shape.

The freezer room of the lodge had previously been a large coal bin. At the time it was constructed, Mr. Kromer was still a York commercial refrigeration distributor in Cleveland, so he sent two of his installation men up to Aberdeen with a truck and the equipment to be used on the job.

Equipment used in the installation consists of one 1½ H.P. 15 W York condensing unit, connected to eight freezing plates which are located in the sharp freeze room, dimensions of which are 12 by 8 feet.

Getting the cork insulation to be used on this job also was a problem, since war controls were in effect at the time the job went in and cork-board was restricted to other uses. Mr. Kromer finally was able to obtain some cork blocks that were sal-

Pheasant hunters' paradise: Dakota Ring Neck Lodge, operated by Ray Kromer, Cleveland refrigeration engineer-contractor.

A corner of the comfortable lounge, typical of the deluxe appointments.



# BIRD

vaged from the disastrous East Ohio Gas Co. fire in Cleveland, and these were used in the installation.

Quick freezing is the thing responsible, above all else, for the prime condition in which birds are kept for shipment back to hunters' homes, Mr. Kromer believes. The birds are dressed, packed in cellophane bags and frozen within two hours after being brought in from the field. Temperature of the plates is held at  $-40$  F. for fast freezing.

"We have had many letters from our guests complimenting us on the fine condition of the birds," Mr. Kromer says, "which we attribute primarily to the quick freeze at this low temperature."

Separated from the quick freeze room is the holding room, which is served by a W75 FS York condensing unit, connected to five plates. After being quick frozen, the birds are taken to this room for storage until they are shipped to the hunter's home. A temperature of  $10$  F. is maintained in this section.

The coolers are built in one unit, with a dividing wall and a door from the outside providing access to the storage room. The quick freeze room is entered from the storage room.

Each day during the hunting season, something like 400 birds go through the quick freeze room for processing. They are shipped out at the end of each week by express, after being carefully packed and serviced with dry ice.

This year the lodge has placed an order for cartons to allow individual packing of the birds. If delivery is obtained, guests of the lodge will be showing their friends cartons printed with this legend:

*"This bird was shot by \_\_\_\_\_  
on ( date ), while a guest at  
Dakota Ring Neck Lodge, Aber-  
deen, South Dakota."*

Three recipes for roasting, baking  
*Continued on page 71*

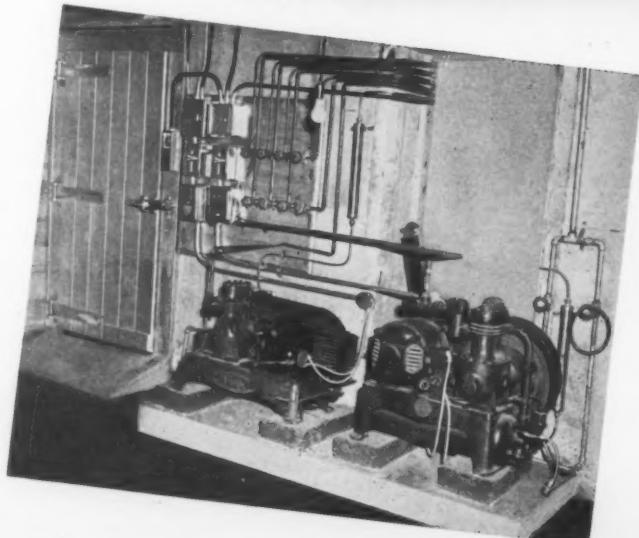


Saving the shot. Here the birds are cleaned and prepared for their quick-freeze treatment.



The lodge's freezer room 12 by 8 feet, is held at minus  $40$  F. Fast freezing assures a first-class job.

Exterior of the freezing and storage rooms, showing the York compressors used. Holding room is at  $10$  F.





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# Cooling for HUMAN COMFORT

By S. C. Moncher

## SOURCES OF HEAT (PART 2)

**SOLAR RADIATION THROUGH WALLS, ROOFS, AND WINDOWS:** Solar radiation is a very important factor in the calculation of heat gains for comfort cooling applications. In fact, where the amount of



glass exposed to the sun is high, and awnings or special blinds are not provided, the heat load from solar radiation may be as high as 70% of the total load.

Ordinary window glass transmits through itself over 90% of the radiant heat which strikes its surface. Heat from solar radiation is also transmitted through roof and walls, but the calculation of the amount of heat thus transmitted is too complex to be of any practical value.

It is customary, therefore, to add an arbitrary factor to compensate for

the heat gain due to radiation through roof and walls. Due to the importance of solar radiation in comfort cooling applications, it will be discussed in detail below.

It should be noted in passing that in heating applications, the heat gain from solar radiation is usually neglected, inasmuch as the peak load for heating may occur at night or during cloudy days. The peak load for cooling, however, is apt to occur when the sun is bright, so that this source of heat must always be included in the total heat load.

**INTENSITY OF SOLAR RADIATION:** In the northern hemisphere, the movement of the earth about the sun is such that an *east* wall receives the sun's rays in the *morning*, a *west* wall in the *afternoon*, and a *south* wall during *late morning* and *early afternoon*. A wall facing due *north* does not get any direct sunshine. A *horizontal* surface, such as a *roof*, however, is exposed to the sun's rays all day.

Now, the amount of solar radiation absorbed by a surface varies greatly with (1) the intensity of the sun's rays, (2) the nature of the surface, and (3) the angle at which the sun's rays strike the surface. A black sur-

face perpendicular to the rays of the sun at noon in midsummer can absorb as high as 300 Btu per square foot per hour, while a polished aluminum surface under the same conditions will absorb less than 100 Btu.

As the angle of the sun's rays striking a surface becomes less than 90 degrees, the intensity of solar radiation diminishes. For an east wall, the maximum intensity occurs about 8 A.M. (sun time); for a west wall, about 4 P.M.; and for a south wall or roof, at noon.

The values of maximum intensity of solar radiation against walls and



roofs on Aug. 2 at 40° N. Lat., as given in the "Guide" of the American Society of Heating and Ventilating Engineers, are as follows: east wall, 211 Btu per hour per square foot;

south wall, 128 Btu per hour per square foot; west wall, 211 Btu per hour per square foot; horizontal roof, 290 Btu per hour per square foot.

**TIME LAG IN TRANSMISSION THROUGH WALLS AND ROOFS:** We have noted that plain window glass transmits over 90% of the solar radiation which impinges upon it. This transmission is instantaneous, and serves immediately to warm the room into which it strikes. Now, the nature of the heat generated within the room is such that the glass will not transmit it outward, and the heat is trapped within the room, so to speak.

In the case of exterior walls and roofs, however, the effect of solar heat is not transmitted immediately within the building, for the heat is first utilized in raising the temperature of the wall or roof. Ordinary wood construction will have a time lag of 1 to

2 hours, increasing to 4 to 5 hours if the air space is filled with insulation. Masonry walls and roofs have a larger capacity for heat, and the time lag between the maximum solar heat intensity and the maximum heat flow into the room usually varies from 5 to 10 hours, depending on the thickness of the structure. This means that in certain cases the maximum effect of solar radiation may not be felt until the evening, when it will be counteracted by a decrease in heat from other sources.

For walls and roofs of average construction, however, the heat transmission due to solar radiation usually becomes significant during the following hours: east wall, noon to 10 P.M. (peak 4-7 P.M.); west wall, 6 P.M. to 4 A.M. (peak 8-12 P.M.); south wall, noon to 8 P.M. (peak, 3-6 P.M.); horizontal roof, 10 A.M. to 10 P.M. (peak, 2-4 P.M.). The gain through southeast and southwest

walls may be considered the same as through east and west walls, while the gain through northeast and northwest walls may be considered as half the gain through east and west walls.

**EFFECT OF SHADING AND ROOF VENTILATION:** When a wall is completely shaded by an adjoining building or a neighborhood tree, the effects of solar radiation may be ignored. If natural shading does not



already exist, it is advisable to consider the use of awnings or blinds.

Although the use of these devices may not be practical for shading a whole wall, they are certainly practical for use over windows, and the shading of all except northerly exposed windows should be mandatory in every comfort cooling job.

The use of a canvas awning over a window will cut down the solar heat transmission from a peak of approximately 200 Btu per hour per square foot through windows facing east and west to approximately 50 Btu per hour per square foot; and for windows facing south, from approximately 100 Btu to 25 Btu.

Venetian blinds are not as effective as awnings, admitting about half as much heat as bare glass, when the slats of the venetian blinds are at an angle of 45 degrees. A fully drawn roller shade is equally effective, but has the disadvantage of shutting out more light.

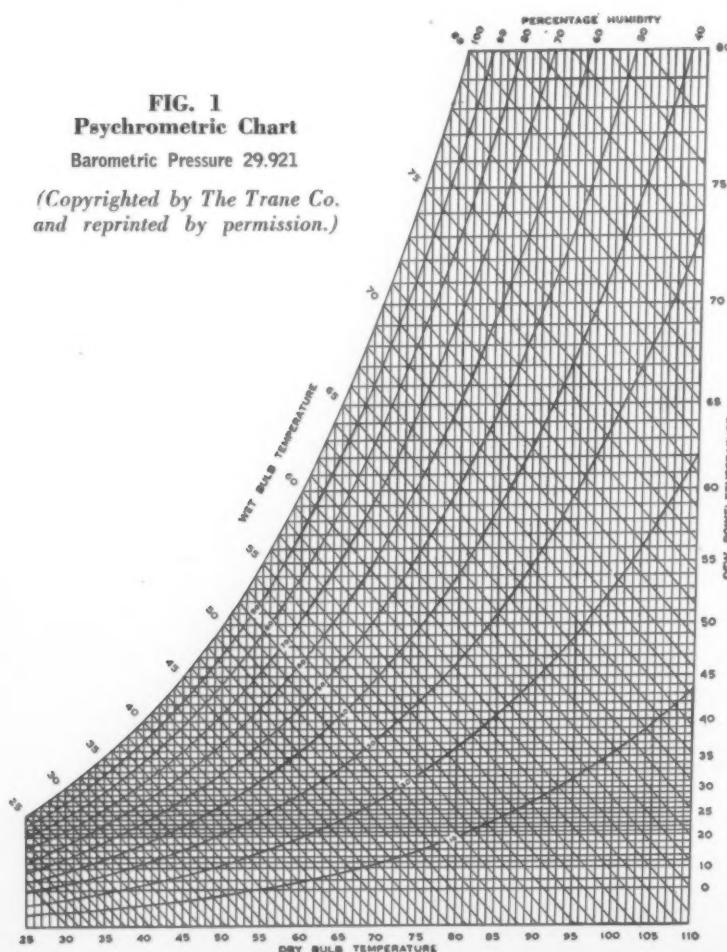
Hollow glass building blocks may be figured as transmitting about  $\frac{1}{3}$  as much heat as ordinary glass, which means that they transmit over ten times as much heat as an average wall.

The effect of solar heat on roofs can be largely nullified by the construction of a ventilated air space above an insulated ceiling. This is particularly effective in the case of a sloping roof when the whole attic can be ventilated.

Ventilation may be natural, accomplished by louvres on opposite sides, or forced, accomplished by means of a fan. Another method of

**FIG. 1**  
**Psychrometric Chart**  
Barometric Pressure 29.921

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minimizing the effect of solar radiation on roofs is to keep the roof continually wetted. The evaporation of water produces a cooling effect, thereby counteracting the solar heat.

**ARBITRARY ALLOWANCE FOR SOLAR RADIATION:** In order to simplify comfort cooling calculations, one method is to make an arbitrary allowance for solar radiation on roofs and walls. If the peak load occurs in the morning, the effect of solar radiation may be ignored.

If, however, the peak load occurs in the afternoon or evening the following number of degrees may be added to the design dry bulb temperature in calculating heat conduction through walls and roof:

EVENING	AFTERNOON
20°	roof 30°
10°	east wall 20°
20°	west wall 0°
5°	south wall 10°

For dark surfaces, these values should be increased 50%, while for light and bright surfaces, they may be decreased 50%. [Note: In the next article, a more accurate method of accounting for solar heat will be described.]

Values for solar heat transmission through windows should be ascertained directly from tables for the hour of the peak load. Such tables are published in the "Guide" of American Society of Heating & Ventilating Engineers and in manuals put out by various manufacturers of air conditioning equipment. For example, the table in the 1946 Guide gives the following values for 10 A.M. and 4 P.M.:

	E	S	W	H*
10 A.M.	125	66	16	262
4 P.M.	14	18	193	167

\*Horizontal.

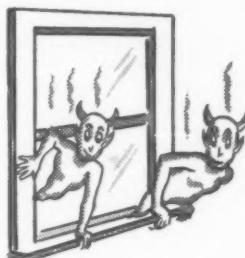
Values given are in Btu per hour per square foot for single unshaded glass on Aug. 1 at 40 degrees North latitude.

When a window is exposed to the sun, it is customary to neglect the heat conveyed through it by conduction due to the temperature difference between its two surfaces, inasmuch as this is usually insignificant compared with the heat transmitted due to solar radiation.

For those hours, however, when the conduction load exceeds the solar ra-

diation load, the value of the former is used. For example, the solar radiation through a shaded south window at 4 P.M. is approximately 9 Btu per hour per square foot, whereas the conduction load is 17 Btu per hour per square foot for a 15° temperature difference.

**HEAT FROM OUTSIDE AIR:** We are all familiar with motion pictures showing men suffocating in a sunken submarine due to lack of fresh air. Fortunately, suffocation from this



cause is practically impossible in ordinary buildings due to the constant infiltration of outside air through cracks around doors and windows, and even through the walls themselves.

The outside wind velocity and the number of times the door leading to an enclosure is opened also affect infiltration, the amount of air filtering in increasing as these two factors increase. Normal infiltration in buildings of conventional structure will provide from 1 to 3 air changes per hour, thereby furnishing enough oxygen to take care of the chemical processes of human respiration for all except the most unusual cases of human occupancy.

When human occupancy is high, however, the introduction of outside air in quantities larger than that provided by infiltration is usually desirable in order to dilute body and other odors, and to clear the air of tobacco

smoke. For enclosures in which there is no smoking, 5 to 15 cu. ft. of air per minute per person usually suffice to revitalize the air; while when heavy smoking is present, up to 30 cfm. may be necessary.

If sufficient outside air is introduced into an enclosure through infiltration, no more need be added to the cooling unit. On the other hand, if, as is often the case, additional outside air must be provided, it should be supplied directly to the cooling unit through a duct from the outside.

When outside air is supplied directly to the cooling unit, the amount entering through infiltration may be neglected. This is due to the fact that the outside air entering through the cooling unit builds up the pressure within the enclosure, and cuts down the infiltration to an insignificant amount. The movement of air through cracks and crevices is now outward.

The estimation of the quantity of air entering through infiltration calls for the exercise of good judgment, for type and quality of construction are all-important factors. For example, weather-stripped windows cause



less infiltration than non-protected windows, while sealed windows cut off infiltration entirely.

The author recommends that a minimum of one air change per hour be attributed to any enclosure of con-

*Continued on page 46*

### FORMULA III

(Method of calculating heat load due to outside air.)

$$\text{Btu per Hour} = \frac{\text{CFM} \times 60 \times \text{Heat Content of Indoor Air}}{\text{Specific Volume of Air, Cubic Feet per Pound}}$$

(Heat Content of Outdoor Air minus)

# "LIQUID" REFRIGERATION SYSTEMS... PART VIII

Here are further helpful hints on trouble-shooting technique for "bobtails" and other soda fountain refrigeration equipment

ON ALL capillary tube expansion systems, freeze-up due to the presence of moisture will occur at the end of the capillary line. If applying heat at this point doesn't free the flow of refrigerant, the cause of the trouble is not moisture, but rather plugging due to dirt or maybe even drier crystals that may have gotten through the dryer screens. To correct, disconnect the capillary at both ends and blow backwards through the line to clear out the restricting particles.

Figure 23 shows a typical pull-out

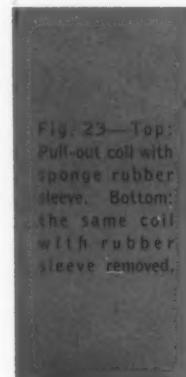
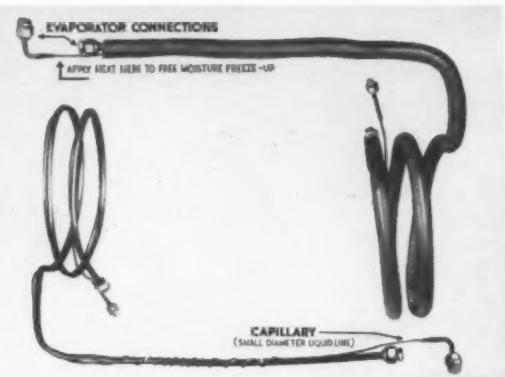


Fig. 23—Top: Pull-out coil with sponge rubber sleeve. Bottom: the same coil with rubber sleeve removed.



coil capillary tube assembly as used on "liquid" ice cream cabinets, indicating the point at which to apply heat to free a moisture restriction.

## Low Side Float Valves

Low side float valves were used in "liquid" and fountains of other manufacturers until early 1941; and since there are thousands of these

units still in service, a few words regarding their servicing problems are advisable.

Two general types of low side floats have been used in "liquid" fountains—the standard Frigidaire float and the special XA type. The difference between these two floats is in the size of the orifice and application. The orifice for soda fountain standard floats for  $\text{SO}_2$  is No. 55 drill size, while the XA orifice is  $\frac{3}{32}$ " drill.

The XA float is used only on  $\text{SO}_2$  hook-ups, and is stocked only by "liquid" service parts depots. The orifice for standard Freon-12 soda fountain float valves is No. 58 drill size.

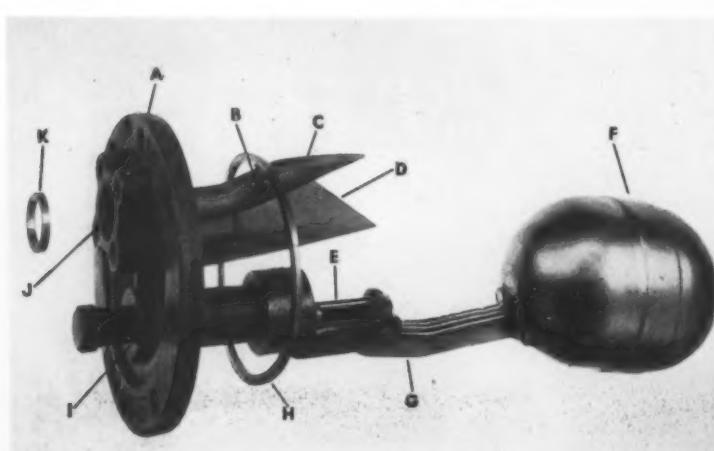


Fig. 24—Exposed view of float valve for soda fountain application. (A) Header plate; (B) oil return hole; (C) suction tube; (D) baffle plate; (E) needle valve; (F) float ball; (G) float ball arm; (H) header gasket; (I) liquid valve connection; (J) suction valve connection; (K) suction valve gasket.

The XA type float was used only in the ice cream section evaporator on fountains up to 1935 models on all feed-over types of systems, that is (1) systems feeding over from the water cooling section "boiler" through the syrup rail to the ice cream section, or (2) through an automatic expansion valve controlling the syrup rail to the ice cream section evaporator. The QA float with the larger orifice was required on these hook-ups to reduce the restriction to flow preventing starved evaporator conditions from developing in the ice cream section.

The special XA float must only be used in "feed-over" systems where a reduced pressure exists because due to the larger orifice size, the XA float will not close off at higher than from 12 to 15 lbs. pressure. If used under full condensing unit head pressure, the valve will leak and result in flooding of the evaporator during "off" cycles, with sweating and frosting back to the condensing unit at the start up of each "on" cycle.

#### Solid Arm Satisfactory

The solid arm type float has generally proved more satisfactory for soda fountain work than the spring (articulated) type float. Since all float valves are calibrated to insure proper oil return and to maintain correct refrigerant level within the evaporator, they must be handled with extreme care. If handled carelessly, the arm may be bent, upsetting the calibration, or the seat or needle may be damaged.

If the calibration is too low, the oil blanket on  $\text{SO}_2$  may be too heavy which would result in a lower than normal suction pressure and longer running time. If the calibration is too high, trouble will be experienced with excessive sweating or frosting back of the suction line.

Float seats and needles are protected prior to installation by a metal spacer strip, which holds the needle off the seat. Be sure to remove this strip before installing the float in an evaporator. The strip locks the float in the "open" position and unless removed will prevent the float from closing.

Many times a float valve needle may be held slightly open by a particle of dirt under the needle. This

*Continued on page 43*



## Go South, Young Man

IF Horace Greeley were to make his famous statement in the light of today's market for refrigeration equipment, he'd phrase it "Go South, Young Man," believes R. S. Wieding, president of United Refrigerator Mfg. Co., sales division, St. Paul, who has just returned from an extensive survey of the Mexican market, particularly as it concerns the refrigeration field.

In Mr. Wieding's opinion, Mexico presents "wonderful opportunities" for the expansion of American industry.

Starting with Refrigeracion y Calefaccion S.A. of Mexico City, distributors holding a "United" franchise for all of Mexico and specializing in the distribution of refrigeration and heating equipment, Mr. Wieding followed through with visits to the company's branches in Monterrey, Tapachula, Vera Cruz, Guadalajara, Torreon, Tampico, Pueblo and Leon. Refrigeracion y Calefaccion handles American-made products exclusively, since these are rated as "tops" throughout the nation.

Under a definitely pro-American administration, Mexico is looking to the United States to raise its standards of living through the many electrical and mechanical appliances which we, in this country, accept as a matter of course, Mr. Wieding says. The government's first interest, from a health standpoint, is in improving the daily menu of its people, he asserts.

Food is abundant, but at present comparatively little provision is made for its processing and preservation, Mr. Wieding says. There is in Mexico, in his opinion, an important potential demand for frozen food cabinets, refrigerated meat and vegetable cases, refrigerated reach-ins, walk-ins and ordinary electric refrigerators. Almost no dent has yet been made in the beverage cooling market, he asserts.

Mexico, however, is not depending wholly upon imports in her efforts to raise her living standards, Mr. Wieding says. An industrial zone has been set up outside Mexico City, where manufacturing plants are being built at an increasing rate. Some of these plants will be under American management.

Meanwhile, England is not overlooking this rich and hungry market. Mr. Wieding saw five heavily loaded ships at Vera Cruz, just in from Liverpool.

The American embassy is encouraging as many United States manufacturers as possible to set up sales offices in Mexico, to keep in close touch with their distributors. Mexican business men, Mr. Wieding found, regard us as good next-door neighbors, and look to us to furnish them now with much needed equipment. We must not sell Mexico short as a great market and a great opportunity for United States business to establish itself in that country, he says.



# WHAT KIND OF CONTRACTOR ARE YOU?



Being a good technician isn't enough; you'll need to be a good business man, too, if you're to make the money you should in the years ahead. That means good bookkeeping and cost records, for "full control"

THE next few years are undoubtedly going to bring plenty of business to the energetic refrigeration contractor. You should "go to town," and you will, if you watch your step. But with high material costs, high wages and inexperienced or green help (some of which you'll have to have because there is not enough seasoned help to do this job), you can go broke quicker than ever before if you are not "on the beam."

You will have to be a good business man, as well as a keen technician and contractor, if you are to make the money you should make during the years immediately ahead.

Does that sound depressing? It shouldn't! Maybe it means you are going to get more satisfaction out of conducting your business than ever before. It can very well mean just that.

It does mean you are going to have to watch your business and know at all times exactly where you are—which means *good bookkeeping and cost records*. What good is it going to do you to make careful and accurate estimates and secure contracts on which you *should* make money unless your *costs* of doing the job come reasonably close to your estimates? You've got to know how you are coming out on your jobs—you can't guess!

By Guy M. Carson  
Comptroller, Tallman, Robbins & Co.

Likewise, many a good man has failed to make good in a big way simply because he did not know his overhead; therefore he could not control it, and did not know when it increased too much, nor how much to add in his estimates to his direct expenses to cover that overhead.

## What Accounts to Keep?

No matter how big or how small the operation, such information is priceless. Therefore, any bookkeeping system, to be of assistance to the contractor, must not only furnish this necessary information, but also supply the cold facts so that the contractor or builder can tell as he goes along how he is coming out on each job—whether he is making money or losing money, or on what operations a profit or loss is being sustained. Upon the completion of any job, the contractor must be able to tell how much actual, or net, profit was made on the entire project.

Today's great need for new refrigeration equipment of all kinds, remodeling, maintenance and repair recalls and re-emphasizes the need for the kind of records which are of real value in this field.

Years ago, before income and social security taxes, and before the days of high costs and keen competition, accounting records were kept largely for the purpose of preventing someone from beating the business man out of money. In these days of more complex business operations, that is perhaps one of the least important reasons for keeping bookkeeping records.

Doing business under present-day conditions, the boss can figure himself out of more money one way or another than most of his customers or employees can.

Today there are five principal reasons for keeping accounting records:

1. To keep a record of your accounts—how much is due you—how much is due others, etc.
2. Uncle Sam and his taxes.
3. Know your costs—how you are coming out on individual jobs and operations.
4. Know your percentage of overhead expenses.
5. Business management.

Taking each of the above in turn:  
1. It is important to know who owes you money and how much, and how much money you owe, and to whom, and to keep a record of your assets. That's fundamental.

2. Uncle Sam says you must pay income tax, old age benefit, social

*Continued on page 48*

# MAKING HEADLINES and PROFITS-- *Coast to Coast!*

A cooling unit that combines high humidity with temperatures down to 36°F.! No wonder the AMCOIL UTILITY Food Conditioner has awakened amazing interest in the trade since its introduction less than six months ago.

Hundreds of jobbers and dealers have found that this Unit more than meets the need for moderate-priced cooling equipment to do the *double job* of cooling and preventing dehydration. Only a Food Conditioner can do that—and AMCOIL has the *only* Food Conditioner!

Its unique construction, with built-in humidifier, enables it to cool down to 36°F. while maintaining high relative humidities up to 85%—producing the *one* condition that prevents dehydration and shrinkage of meat and perishable foods. When stored at proper low temperature and high humidity, meat retains its natural bloom and freshness—there is little waste from trimming. What a boon to butchers—what a chance for YOU to give it to 'em—at a good margin of profit too! Investigate today.

Also—the DELUXE Food Conditioner, slightly higher in price than the UTILITY model—with extra features, valves and controls. Send for Bulletin FC.

• Companion to the UTILITY Food Conditioner is the regular UTILITY Down-Draft Cooling Unit for storage of package commodities and bottled goods where dehydration is not a factor.



## UTILITY FOOD CONDITIONER

KEEPS FOODS, MEATS FRESHER

Available for all sizes of cooling boxes and display cases. Streamlined. Maroon and black oven-baked enamel.



## UTILITY DOWN-DRAFT UNIT

FOR BOTTLED AND PACKAGED GOODS

This wall-mounted unit available in every size—from smallest back-bar to the new 8 ft. high walk-in boxes. Cools only.

### TWO-WAY CEILING-MOUNTED COOLING UNIT



Easy to Install • Easy to Make Connections • Easy to Service

For efficient cooling down to 36°F., this general utility, ceiling-mounted unit is made in sizes adapted for reach-in boxes and walk-in coolers. Air enters bottom of unit and is discharged horizontally in two directions along ceiling, insuring distribution of cooled air over entire cooler. Ideal for cooling packaged and bottled goods where dehydration is not a factor. Write for Bulletin UW.

ALSERVICE  
OPEN FACE



DELUXE FOOD  
CONDITIONER



REACH-IN  
PANEL UNIT



ZERO BREEZE  
LOW TEMP. UNIT



COMING SOON  
DISPLAY CASE  
FOOD CONDITIONER



Model DWF

SEND FOR BULLETIN

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Robbins-Greenwood Co., 3104 Main St., Houston 4, Texas

J. York Feltel, 813 Howard St., New Orleans, La.

Ernest Darwin Corporation, P. O. Box 2654, Charlotte 1, North Carolina  
A. J. Nelson Co., 1635 Blake St., P. O. Box 2244, Denver, Colo. (Cherry 4131)  
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1553 N. 37 St., Seattle 3, Wash.



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## LOOK FOR THESE

*Calibrated dials*

*Independent adjustment of cut-in  
and cut-out pressures*

*Totally enclosed dust-proof  
snapswitch*

*Cold control adjustment*

*Tamper-proof cover*

*Capillary pressure connection*



All these features are standard on Minneapolis-Honeywell Refrigeration temperature and pressure controls. Many others, especially designed to meet your individual requirements, are available. See your Honeywell branch or jobber for details. Minneapolis-Honeywell Regulator Company, 2909 Fourth Avenue South, Minneapolis 8, Minnesota.



Are you missing any



# Good Bets?

DO YOU play only the odds-on favorites, the "sure things," when it comes to prospects for commercial refrigeration sales? Are you forgetting that there's many a good bet bunched back there with the "dark horses"?

If so, then the chart below may slip you a hot tip or two as to where you may look for a sales "winner."

Or if it's service you're interested in, just scan the right-hand side of this chart . . . then pick up your tools and start making some of those long-neglected calls.

*(This chart was prepared by the Commercial Refrigeration Department, Airtemp Division, Chrysler Corp., and is reprinted by permission.)*

## THE COMMERCIAL REFRIGERATION MARKET

EQUIPMENT REQUIREMENTS		SERVICE REQUIREMENTS		REMARKS
PROSPECTS				
APARTMENTS & HOTELS				
AMUSEMENT PARLORS				
AMUSEMENT PARKS				
AIR PORTS				
BAKERS				
BARS				
BANKS				
BARBER SHOPS				
BOATS				
BOTTLING PLANTS				
CHURCHES				
CANNERIES				
CLINICS				
CLUBS				
CREAMERIES				
DAIRIES				
DAIRY BARS				
DRUG STORES				
EXPERIMENTAL LABS.				
FACTORIES				
FARM				
FIRE STATIONS				
FLORISTS				
FOOD PROCESSORS				
FRUIT DEALERS				
FURNITURE				
HAIR SALONS				
MOTOR PALEYS				
PALEYS				
GAZOLINE STATIONS				
DRUGSTORES				
HOSPITALS				
HOTELS				
INSTITUTIONS, CITY, STATE				
JEWELERS				
LAUNDRIES				
LINENARIES				
LOCKER PLANTS				
MARSHES - SUPER				
MEAT MARKETS				
NURSERIES				
OFFICE BUILDINGS				
PHOTO DEVELOPERS				
PUBLIC BUILDINGS				
RAILROADS				
RESIDENCES				
RESTAURANTS				
SCHOOLS				
SLAUGHTER HOUSES				
STORES - DEPARTMENT				
STORES - CONFECTIONARY				
STORES - DELICATESSEN				
STORES - CLOTHING				
COLD STORAGE WAREHOUSES				
FARM COOPERATIVES				
THEATRES				
TELEPHONE EXCHANGES				
U.S. ARMY				
U.S. AIR CORPS				
U.S. COAST GUARD				
U.S. NAVY				
U.S. MARINE CORPS				
U.S. MARITIME COMMISSION				
U.S. POST OFFICE DEPT.				
U.S. VETERANS ADMINISTRATION				
WAITING ROOMS-STATION				
WAREHOUSES				



**Robert L. Tyler** has been unanimously elected president of the Tyler Fixture Corp., succeeding his brother, Jerry Tyler, who died as a result of injuries received in the LaSalle Hotel fire in Chicago. The new president has been with the company since 1928, and formerly served as midwestern divisional manager with headquarters in Chicago. He was elected a director and first vice-president of the corporation in 1941, just a few months before being commissioned a 1st Lieutenant in the Army Air Forces.



No other changes are being made at this time among Tyler executive personnel, which includes: Joseph W. Krall, executive vice president; Geo. H. Mayhew, secretary-treasurer; Carl Eliason, vice president in charge of national accounts; and Earl Kent, director of production.

**Charles M. Campbell** and **S. David Horner** have been named managers, respectively, of the branch offices newly opened in Cleveland and Detroit by Perfex Corp. Mr. Campbell has been with Perfex since



Mr. Horner



Mr. Campbell

1944, when he joined the company as a sales engineer. Mr. Horner joined Perfex in a similar capacity in January, 1946, following his discharge from the Navy.

**Harold C. Hickock** has been appointed central district manager of the B. F. Sturtevant Co. division of Westinghouse with headquarters in Pittsburgh. Mr. Hickock, who formerly served in the same capacity for the company's Elevator division, is succeeded in this post by Dallas W. Norris, formerly manager of the St. Louis district of the Elevator and Air Conditioning division.

Two new district managers have been appointed by Deepfreeze division, Motor Products Corp. **C. T. Redding** will serve in this capacity in the Chicago area, while **L. R. Diemand** will handle the Cleveland



Mr. Redding



Mr. Diemand

district. Mr. Redding formerly was industrial sales manager for Deepfreeze in the company's North Chicago office. Mr. Diemand previously was associated with General Electric Supply Co. and with Butler Bros. in Chicago as branch sales manager.

**E. H. Joern**, district representative, has been named manager of the newly opened St. Louis office of Mueller Brass Co. **John M. Zaya**, formerly assigned to the company's general sales department at Port Huron, Mich., has been transferred to the St. Louis sales organization.

Managers of three additional regional territories for Admiral Corp. have been announced as follows: northeastern region, **E. M. Perkins**,

with headquarters in Boston; central region, **J. F. Gilbarite**, with headquarters in Cleveland; midwestern region, **P. R. Dye**, with headquarters in Milwaukee.

**Manuel Brown** and **Earl R. Gruebel**, both veterans of the European war, have rejoined the staff of Brass & Copper Sales Co., St. Louis wholesaler of refrigeration supplies. Mr. Brown will head the air conditioning and refrigeration division, while Mr. Gruebel will be in charge of purchasing and city desk work.

**Howard L. Clary** has been appointed general sales manager of Norge division, Borg-Warner Corp. Mr. Clary formerly was assistant sales manager. At the same time, establishment of four new regional headquarters in New York, Atlanta, Chicago, and Los



Mr. Clary



Mr. E. L. Frohlich



Mr. Spencer



Mr. J. H. Frohlich



Mr. Tenney

Angeles. Regional managers in these areas will be **E. L. Frohlich**, **Dean Spencer**, **J. H. Frohlich**, and **J. M. Tenney**, respectively. Each regional manager will be provided with a permanent headquarters and, even

*Continued on page 56*

**YORK**  
USES  
**MUELLER BRASS CO.**  
PARTS IN  
CONDENSING  
UNITS



## **YORK CORPORATION—YORK, PENNSYLVANIA**

● York "Freon-12" condensing units stand out as standard in the refrigeration industry because of certain built-in qualities of excellence. This art of building to meet the exacting demands of industry was not learned in a day—it was acquired only by systematic and cumulative progress . . . design . . . research and development.

Compressor crankcase and cylinders are cast integrally from electric furnace nickel iron, having uniform high tensile strength and hardness...crankshaft is of special high grade die forging steel, hardened and micro-ground, force-feed lubricated. Other parts made of finest quality materials and York precision manufacture assure lifelong economy and dependable performance.

### **THESE PRODUCTS**



## **MUST BE GOOD!**

**BUILT-IN QUALITY . . .**

**TIME-TESTED PERFORMANCE**

Mueller Brass Co. Valves, Fittings and Accessories for mechanical refrigeration have a well-earned reputation for built-in quality and time-tested performance. They are manufactured specifically for mechanical refrigeration work. **THEY ARE USED BY ALL OF THE LARGEST MANUFACTURERS THROUGHOUT THE UNITED STATES.** Mueller Brass Co. products must be good!

**MUELLER BRASS CO.**  
**PORT HURON, MICHIGAN**

# THE Profit SIDE OF Produce

HOW does mechanical refrigeration equipment help the wholesale produce merchant make more money?

How does it give him a head-start on those of his competitors who don't have such equipment?

Looking at it through the eyes of the user, rather than those of the refrigeration contractor's salesman, how does refrigeration stack up as a "partner" in the wholesale produce business?

Here is what refrigeration equipment means to one such produce merchant, M. B. Feren, who with Hal Feren and Paul Nagelbush operates Feren Produce Co. in Cleveland's Terminal Food Market. A system to allow extended storage of fresh vegetables, fruit and other produce was recently installed for the company by Refrigeration Maintenance Corp.

There is some pretty powerful sales ammunition in what Mr. Feren finds refrigeration can do for him:

First of all, it will enable him to

take advantage of today's uncertain market conditions as they affect fresh produce. This applies both to the supply of produce available from time to time, as well as to the prices at which it is offered.

The produce business is operated very closely by the age-old law of supply and demand. When supplies are plentiful, the wholesaler is able to buy at just about his own price; but commodities that are in short supply bring premium prices because of the extra-heavy demand for them. Conditions can vary greatly even from day to day—yesterday's plentiful item being tomorrow's scarcest.

And, as refrigeration men (by knowledge) and produce men (by sometimes bitter experience) well know, fresh produce is one of the most perishable of commodities. It has to be in top condition to bring a fair price. Once it starts to deteriorate, the wholesale produce merchant has to move it—and fast!—if he's to salvage anything at all from his investment. Often, without refrigeration, that means selling at a substantial loss.

With adequate refrigeration, however, as Mr. Feren has found, he's ready at all times to take advantage of "good buys". If the day's supply of spinach or iceberg lettuce, for example, is heavy, he can buy up enough to take care of his customers' wants for several days. And do plentiful supplies mean bargain prices? Mr. Feren says it often means the difference of \$1.50 a case on asparagus, with corresponding bargains on other types of produce which happen to be "long" on any particular day.



An exterior view of the produce storage room, showing location of the condensing unit. Note that guard-rail is provided to protect unit against bumps and damage.



Here's how the cooling units are located along the wall of the storage room. Plenty of coil capacity is provided to allow high humidity, low air movement.

# Cooling

dition you can use in your calls  
ant prospects in your territory—  
f what refrigeration equipment  
uce man in profits and good will



Here's just a part of the cargo of produce that refrigeration helps keep fresh and salable. In today's market, being able to buy "right" is important, and refrigeration helps here, too.

So much for refrigeration's help in enabling the produce wholesaler to buy "right". In what other ways does it help?

In Mr. Feren's experience, it enables him to give his customers what they want, when they want it. It enables him, in short, to be a dependable source of supply for his customers. And you can't discount the importance of that in the produce field.

## Can Buy in Advance

With refrigeration, Mr. Ferens is able to buy his supplies a day in advance, and have them ready for his customers during the first hour or two the market is open in the morning. That's especially important—for retail merchants, many of whom don't have storage for extra produce in their own stores, are in the market at daybreak (or before) to pick up their anticipated needs for the day.

And they're apt to be fast, impatient shoppers. If their regular wholesaler doesn't have what they want, they move along to the next one—and if they have to shop around much to get many of the things they want, they're just as apt as not to change suppliers, too. Lost customers mean lost profits, and the produce wholesaler does everything he can to keep his regular customers with him, and to use them in attracting new ones.

Two hours' sales early in the morn-

ing—if you're in shape to handle them—are worth most of the balance of the day, Mr. Feren says. You either catch 'em first thing in the morning or you wait until the following day—if they come back.

Having what your customers want, when they want it, is all-important in the produce business, Mr. Feren says. If retail food merchants know they can depend on you to supply them, they'll be your regular customers. If they aren't sure, they'll go to the wholesaler they think can give them what they want.

## Quality is Protected

Another important function that refrigeration performs for the produce wholesaler, Mr. Feren says, is helping him to protect his customers from a "quality" standpoint. With adequate refrigeration, the wholesaler can be sure the retail merchant is getting produce that's in A-1 condition for resale. The retailer, unless he has over-bought, can sell all he has and realize his full profit.

His customers, the housewives, compliment him on his fine quality produce; he's happy, and he comes back to the wholesaler for more. And refrigeration shares the wholesaler's bow, for it's done the job.

On the other hand, if the retail merchant gets many kicks from customers on the quality of his produce, the wholesaler if the first person he'll

blame—and he'll take his business somewhere else.

Especially in hot weather, refrigeration is important in reducing the spoilage of produce, Mr. Feren says. Before he installed his present equipment, he used to have to sell quick, in summer weather, and he'd have to take whatever price he could get. It was either that or taking a chance of losing it all by spoilage. Now he's able to buy "right", and sell "right", too.

To those of his customers who have refrigeration storage equipment of their own, the wholesale produce merchant often can offer special "buys" on merchandise on which the market happens to be especially "open". He can sell them several days' supply, which they can store in their own refrigerators until they need it.

## Details of Equipment

The room used for produce storage by Feren Produce Co. is 28 x 15'6" x 10 feet high. It is held at a temperature of 36-38° F. with high humidity. Room and coil temperatures are held within 10° T. D. for best storage conditions.

The system, which uses three Marlo low side units, one of which has a capacity of 14,000 Btu and the other two with capacities of 10,750 Btu each, is powered by a 3 hp water-cooled condensing unit. Each of the Marlo units is served by a Detroit

thermostatic expansion valve. Manual switches are provided on each unit, to assure constant air circulation independent of condensing unit operation.

Total load requirements for the system were estimated at 32,000 Btu per hour, including heat leakage and product load.

#### Extra Coil Surface

Coil surface on this installation is considerably more than that which is normally used; this was done to permit low temperature differential, with higher humidity. Normally, two cooling units would be sufficient to handle the job. The additional unit is in the nature of a reserve, assuring adequate cooling should one of the others be out of operation temporarily. All three units are operated continuously, however, to obtain desired conditions of humidity within the cooler.

The cooling units are located along the right side of the cooler, lengthwise, and are spaced equally. Because of the close temperature differential maintained, there is no defrosting problem. The extra coil surface permits air to be introduced into the refrigerated space at low velocity, another important factor in preventing dehydration of the stored produce.

#### Insulation Data

Insulation used for the storage room is 4 inches of Johns-Manville rock cork, laid up in hot asphalt. Interior of the room is cement plaster finished, scored in 4-foot squares to prevent cracking.

Produce stored in the cooler is racked off of the floor, to allow circulation of air on all sides of it. Floor of the cooler is provided with drains to allow easy cleaning.

#### Unit is Protected

The condensing unit is located at the right in front of the cooler, and is protected against possible damage from trucks carrying produce in and out by a steel tube guard-rail. Switches and controls are mounted on a panel above the condensing unit, which also has a drier—strainer in the liquid line. A pilot light on the entry-door frame indicates when the cooler lights are burning and the cooler is occupied.

## Cooling Helps the Cars Go

ASSEMBLY line use of mechanical refrigeration is one of the new postwar techniques which is helping to speed production of new passenger cars.

Installed directly in the motor production line of one of the nation's largest automobile manufacturers, new mechanical refrigeration equipment is being used to shrink steel valve inserts by chilling for permanent fitting into cylinder blocks.

By chilling at a temperature of  $-120^{\circ}$  F., the inserts are shrunk 0.002-in. and automatically ejected for fitting into the cylinder blocks. In room temperatures, the inserts expand to normal size and become a permanent part of the block. Through this recently perfected industrial application of mechanical refrigeration, it is possible to install the valve inserts at the rate of 360 per hour without interruption of the assembly line.

Shrinking of close fitting parts, however, is only one of the functions performed by mechanical refrigeration in the construction of modern automobiles.

Much of the steel and other metal which goes into the body of the new cars is stronger and more ductile because it has been subjected to "cold" treatment. High speed drills, hack saws and other cutting tools used in the manufacture of automobiles have a longer life because the ductility and hardness of the cutting edges is increased by cold treating.

Industries closely related to the automobile field also have found cold treating of metals an efficient means of increasing output and lowering production costs.

By applying the principles of mechanical refrigeration, an airplane manufacturer doubled the shrink-fit assembly of airplane landing struts. Another manufacturer effected a substantial reduction in production costs by

utilizing mechanical refrigeration in the shrink-fit assembly of a bushing in the piston of a Diesel engine.

A 50-ton press used by a manufacturer for the assembling of a bevel gear into a spline shaft was eliminated by the adoption of mechanical refrigeration equipment. The low temperature unit is used to shrink the spline, permitting easy fitting of the gear with a hand-operated arbor press. The new method saves considerable production time and also prevents strains which resulted from the former method of assembly.

Use of mechanical refrigeration to shrink a cast-iron cylinder liner into an aluminum engine body has been reported by another manufacturer. The refrigeration method prevents warping.

During the war, it was learned that cold treating of close fitting parts of aircraft permitted these parts to work more freely in high altitude where temperatures approach the sub-zero levels.

Other industrial uses of mechanical refrigeration include testing of aircraft operating instruments, hydraulic shock absorbers, engine lubricants, radio receivers and transmitters, rubber goods and plastics.

Optical companies use mechanical refrigeration to remove pitch from lenses. A watch manufacturer reports that he saves \$11.50 a day by cold treating abrasive compounds. Sub-zero temperatures created by mechanical refrigeration are used for freezing rubber to permit easier machining.

Industrial use of the cold treating process doubtless will continue to expand as factory production increases. Many metallurgists believe that in the near future every up-to-date metal hardening plant will be applying cold treating as a supplement to its regular heat treating procedures.

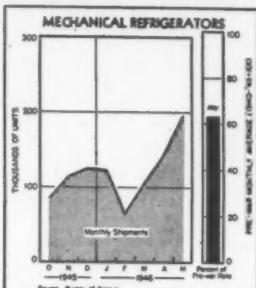
# REFRIGERATION INDUSTRY

# News

## WESTINGHOUSE CO. LOWERS INSTALLMENT PAYMENT RATES

New and lower rates for installment buying of electric appliances have been announced by Westinghouse Electric Corp. through its Retail Finance Division.

Known as the Westinghouse Budget Purchase Plan the new rates are stated to be a continuation of the downward trend in finance charges apparent over the past decade. As an indication of this fact, Westinghouse cites these typical charges to a customer financing a balance of \$150 over 12 months: 1938, \$15.12; 1940, \$11; 1946, \$9.



## MAY HOUSEHOLD SHIPMENTS UP

Shipments of domestic mechanical refrigerators in May hit a new post-war high of 196,000 units, the Civilian Production Administration reports. This was 37% above April (143,000), but 37% below the pre-war 1940-41 monthly rate of 309,000.

Production continued to rise during May despite strikes within the industry and a shortage of materials and parts, the CPA report said. Shortages are particularly acute in tin mill black plate, and in condensers, motors and castings.

Factory stocks were drawn down during May by 12,000 units to 29,000.

## OPA RECORDS

Manufacturers, wholesalers and retailers, and all other persons required under price control regulations to have kept records must preserve them until July 1, 1947, OPA announces.

Supplementary Order 167, effective as of June 30, 1946, requires that records, accounts, invoices, etc. be retained for possible use in any legal actions that might arise because of violations of price control regulations committed before June 30, when the Emergency Price Control Act of 1942 expired.

## LEHIGH TO HOLD FIRM ON PRICES

Reflecting the viewpoint of one responsible manufacturer toward pricing, the Refrigeration Division of Lehigh Foundries, Inc., Lancaster, Pa., in a telegram sent to J. Roland Kinzer, member of the House of Representatives from Pennsylvania, promises to continue its present prices on condensing units until at least October 1, and to follow a policy of self-regulation as its contribution toward stabilization of the national economy.

The telegram to Rep. Kinzer, signed by J. C. Miller, general manager of the Lehigh Refrigeration Division, reads as follows:

"In view of the recent decisions in regard to the OPA, we wish you to know that we feel a responsibility to self-regulate prices. If we are allowed to continue to do so, we shall adhere to the following policy, and have advised our customer, suppliers and employees as follows:

"This is to notify you that the Refrigeration Division of Lehigh Foundries, Inc., Lancaster, Pa., shall continue our present prices until at least Oct. 1, 1946. We shall also notify you on Sept. 1, 1946, what our prices will be to cover the last quarter of the year. We sincerely hope that they will remain unchanged for the balance of the year, and we will make every effort toward that end."

"We hope that this policy will be followed by industry in general, for in our opinion the solution to the inflationary trend is self-regulation and more production. Due to supply difficulties, their costs and present wage levels, this policy entails considerable sacrifice to our company."

"We hope it will be generally followed, which will insure our country's successful fight for economic stability."

## CORRECTION

Several readers have called our attention to an unfortunate typographical error in the "News" section of our June issue wherein we listed REMA as having its headquarters for the All-Industry Show in both the Hotel Cleveland and the Hotel Statler, and did not list REWA at all. Actually, REWA will make its headquarters in the Hotel Statler, while REMA will have its headquarters only at the Hotel Cleveland. We sincerely regret any inconvenience which may have been occasioned by this error.

## MUELLER BRASS CO. OPENS ST. LOUIS SALES OFFICE

Mueller Brass Co. has opened a new office in St. Louis, Mo. at 2807 North Grand Blvd. E. H. Joern, the company's district representative for the past several years, will be in charge. John M. Zayac, recently transferred from the general sales department in Port Huron, Mich. has been added to the St. Louis sales organization.



To brush up on their company's background and overall operations, and to hear its production and promotional plans for the future, field representatives of Deepfreeze Division, Motor Products Corp., met with factory officials at the Deepfreeze plant in North Chicago for an "indoctrination" session. Personnel pictured above include: front row—John Fellman, S. J. Seibert, Thoben F. Elrod, S. E. Schafer, F. F. Duggan, H. W. Whitmore, R. V. Newbell, and D. L. Davidson; back row—J. E. Guertin, J. G. Fath, C. T. Redding, L. M. L. R. Diemand, Harold Jones, J. H. George, and Paul Morrill.

## HOLUB LEAVES IDEAL; HEADS OWN FIRM

Holub Industries, Inc. is the name of a new manufacturing industry started in Sycamore, Ill. by Bert E. Holub, who recently resigned as sales manager of the Ideal Industries, Inc.

Products offered by the new firm include: electric blowers, industrial cleaners, carbon brush seaters, commutator saws and cutters, commutator stones, wire connectors, fuse clip clamps, fuse pullers, fuse reducers, live centers, electric testers, and wire strippers.

## EBCO NAMES NEW OMAHA DISTRIBUTOR

Ebcō Mfg. Co. has appointed the Sol Lewis Co., 2020-22 Farnam St., Omaha, Nebr., as a distributor for Oasis electric water coolers in the eastern half of the state of Nebraska.

## THERMAL CO. ADDS GENERAL MILLS LINE

Thermal Co., Inc., St. Paul, Minn. wholesaler of refrigeration supplies, has taken on distribution of the line of small appliances manufactured by General Mills, Inc. Stocks of the appliances will be located at the company's stores in St. Paul; Great Falls, Mont.; Des Moines and Cedar Rapids, Iowa; and Milwaukee, Wis.

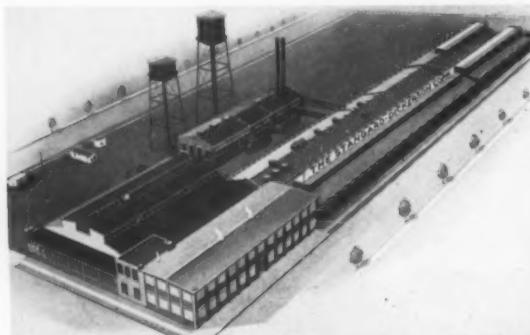
## FROZEN FRENCH FRIES GAIN ACCEPTANCE

Consumer acceptance of frozen "French fried" potatoes has been so great as to require production of 16 1/2 tons a day, according to reports of Maxson Food Systems, Inc. which introduced this food specialty less than six months ago. Distribution already is centered in all large cities east of the Rockies, it is reported.

## EXPANSION MEANS NEW PLANTS



Operations already have commenced in this recently purchased plant of United States Air Conditioning Corp. at Minneapolis, Minn. The new building provides approximately 100,000 sq. ft. of manufacturing and office space to house the company's expanded activities in the production of its complete line of air conditioning equipment.



This plant at Paterson, N. J., has been acquired by Standard-Dickerson Corp. of Newark, N. J., manufacturer of cold plates, ice cream cabinets, and other low temperature equipment. The new plant adds 150,000 sq. ft. to the company's production facilities, and the acquisition also includes extra acreage for future expansion.

## EUREKA WILLIAMS BUYS 'WHITE CROSS'

Eureka Williams Corp. has acquired the National Stamping & Electrical Works, Chicago manufacturer of "White Cross" home and commercial electrical appliances, according to a recent announcement. Purchase of this company also includes the Acorn Brass Mfg. Co., a subsidiary.

National Stamping & Electrical Works will be continued under its own name as a subsidiary of the Eureka Williams Corporation. No change in the present method of distribution of the "White Cross" products is contemplated.

New officers of the National company are: H. W. Burritt, president; George T. Stevens, vice president; H. M. Switzer, vice president; and Fred Stocker (former president) vice president. Frank Matthies, secretary and treasurer will continue in the same position.

## 17 DISTRIBUTORS NAMED BY FROSTAIR

Appointment of 17 refrigeration distributors to handle the Frostair Duplex, combination household refrigerator and home freezer, has been announced by the Frostair Division of General Tire & Rubber Co.

Name and location of these new distributors follows:

E. B. Latham Co., New York City; Kelly-Thompson Co., Duluth, Minn.; Motor Parts Co., Philadelphia, Pa.; Graybar Electric Co., Boston, Mass.; D'Elia Electric Co., Inc., Bridgeport, Conn.

Edward Joy Co., Syracuse, N. Y.; Pittsburgh Products Co., Pittsburgh, Pa.; Peninsular Distributing Co., Detroit, Mich.; General Utilities Corp., Milwaukee, Wisc.; Graybar Electric Co., Chicago, Ill.

North Pacific Supply Co., Seattle, Wash.; Charles S. Martin Distributing Co., Atlanta, Ga.; York Supply Co., Cincinnati, Ohio; Northern Ohio Appliance Distributors, Cleveland, Ohio; Thompson & Hamilton, Inc., Columbus, Ohio; Gem City Appliances, Inc., Dayton, Ohio; and Southern Equipment Co., San Antonio, Texas.

## O'KEEFE & MERRITT PLANS STEEL MILL

Plans for a sheet steel mill with a 50,000 ton per year capacity have been disclosed by O'Keefe & Merritt Co., Los Angeles appliance manufacturer. Construction on the 3 million dollar plant is scheduled to begin next January in Maywood, an unincorporated community near Huntington Park.

The plant will not be a completely integrated mill, but will convert scrap and pig iron into sheet steel. This production will help to alleviate a serious shortage resulting from the withdrawal of Eastern mills from the local market.

Two 50-ton open hearth furnaces will be installed, producing more than enough sheet to fill O'Keefe & Merritt Co. demands. The remainder will go on the market as raw material. The plant should be in full swing by next summer, company officials say.

One of the largest manufacturers of refrigerators, ranges, room heaters, and water heaters on the West Coast, the company was hampered in its reconversion by the difficulty of obtaining enough sheet steel, but the decision to build its own plant was made only after careful study of market surveys and cost studies.

## MIDWEST JOBBERS MEET IN DENVER

A total of 125 refrigeration wholesalers and manufacturers' representatives attended the June meeting of the Midwest Refrigeration Equipment Wholesalers Association in Denver, Col., according to E. L. Bengston, secretary-treasurer of the group.

The wholesalers held one closed session restricted to their own membership, and then an open session in which the manufacturers' representatives joined. Speaker at the banquet was J. S. Kimmel of Republic Electric Co., Davenport, Iowa.

A number of the jobbers attending the meeting accepted the invitation of the McCombs Refrigeration Supply Co. to make an inspection trip through this Denver wholesaler's store. The group also made a tour of the Gates Rubber Co.

## SHOW PROMOTION PIECES AVAILABLE

As part of the advance promotion program for the forthcoming All-Industry Refrigeration and Air Conditioning Exposition, one and two-color electros for exhibitors to use in their own trade journal advertising and literature, and two-color gummed stickers for letter, invoices, bulletins, and literature are now available without charge from Theodore R. Sills & Co., Suite 1020, 39 South LaSalle St., Chicago, Ill.

The electros measure 1 1/2 x 2 inches. The stickers are available in packages of 500. The All-Industry Show Committee has recommended the use of these promotional aids as an important part of the entire promotion program for the show, which will be held in the Cleveland Public Auditorium Oct. 29 to Nov. 1.

Forty-eight more show exhibitors have been announced, bringing the total number of exhibitors to 153 as of July 1.

The 1946 show, which will be the fourth such exposition ever held, is being co-sponsored by the Refrigeration Equipment Manufacturers Association and the Frozen Food Locker Manufacturers and Suppliers Association.

A list of the 48 new exhibitors follows:

Ace Ice Cream Cabinet Co., Aircraft Service Co., American Brass Co., American Flange & Mfg. Co., Inc., American Refrigerator & Machine, Inc., R. H. Bishop Co., Black, Sivalls & Bryson, Inc., Bridgeport Thermostat Co., Century Electric Co., Chrysler Corp. (Airtemp Division).

Cushman & Denison Mfg. Co., Dryer-Hanson, Inc., Drierite Co., Frozen Food Industry & Locker Plant Journal, General Engineering & Mfg. Co., Highside Chemicals Co., Jack & Heintz Precision Industries, Inc., Kalamazoo Vegetable Parchment Co., Kason Hardware Corp., The Livar Corp.

Nevinger Mfg. Co., Inc., Nickerson & Collins Co., Pacific Manufacturing Corp., Polar Hardware Co., Ramsey-Bennett Co., Redmond Co., Inc., Refrigeration Appliances, Inc., Refrigeration Publications, Inc., Rockwell Mfg. Co. (Arcade Division), Rogers Diesel & Aircraft Corp.

Sanitary Refrigerator Co., Schnacke, Inc., Tenney Engineering, Inc., United Frigguator Engineers, Utilities Engineering Institute, Wabash Manufacturing Co., Weber Showcase & Fixture Co., Inc.

Armstrong Cork Co. (Building Materials Div.); The Goodsell Corp.; Grand Rapids Brass Co.; Honor Brand Frozen Foods (Div., Stokley Foods, Inc.); Joliet Chemicals, Ltd.; Linde Air Products Corp.; Shellmar Products Corp.; The Texas Co.; E. W. Twitchell, Inc. (Packaging Div.); U. S. Air Conditioning Corp.; George M. Wessells Co.

## REYNOLDS TO BUILD COMPRESSORS IN MISS. PLANT

A line of refrigeration compressors up to 5-ton capacity will be one of the products to be manufactured in the plant recently acquired and placed in operation by Reynolds Metals Co. at Corinth, Miss., under that state's BAWI (Balance Agriculture With Industry) plan.

The plant also will turn out pneumatic tools and air compressors. It has already been tooled and is in production on a line of 20-hp. pneumatic motors for diamond core drilling. Tooling for production of other units now is in progress.

All products to be manufactured in this plant have been developed in Corinth, according to the company. Foundry, pattern work, tool room and production operations all are accomplished there.

## TESCO OPENS BRANCH

Tesco Distributors (formerly T. W. Binder Co.), Newark, N. J. refrigerator parts wholesaler, has opened a branch store at 54 Lafayette St., Paterson, N. J. A complete stock of refrigeration and air conditioning parts and supplies will be handled in this branch.

## OMAHA FIRM BUILDS 'TAILORED' UNITS

Solid Freeze, Inc., which recently filed articles of incorporation, has started production of custom-made refrigeration units in a plant at 1807 Vinton St., Omaha, Neb. The units will be marketed under the trade name "Solid Freeze," and will include both domestic and commercial walk-in coolers, home and farm freezing units, or vaults, made to customers' specifications and requirements.

The management announced that the units are of all-aluminum construction, with 5 inches of certified insulation, and will maintain constant temperatures at -35 F. A pair of penguins is being used as a trade identifying mark.

The firm has an authorized capitalization of \$50,000 and incorporators are Donald D. Brown, Leslie E. Wilkie and Alvin A. Schepp.

## KEROTEST ACQUIRES WILJACK VALVE

Kerotest Mfg. Co. has announced acquisition of the Wiljack Co., South Pasadena, Calif., manufacturer of bar stock valves in carbon and stainless steel.

## REFRIGERATORS PACE PRODUCTION GAINS AT WESTINGHOUSE

Refrigerator production at the Westinghouse Appliance Division, Mansfield, Ohio, has surpassed pre-strike levels and is expected to continue to increase as more steel and component parts become available.

Now in production is the B-7, a 7 cu. ft. home refrigerator, which is being sent to distributors on a quota basis. The ceiling price for this model is \$189.95. Present plans call for production of a 9 cu. ft. model by midsummer.

To meet the present production schedule on refrigerators, plant engineers have installed a conveyor line from the vitreous enameling plant through a partially constructed new building to production aisles in other sections. The new building, part of a \$6,500,000 plant expansion plan at the Mansfield works, will be completed late this summer.

## CROSLEY PLANT WINS NAVAL AWARD



Another testimonial to the value of the wartime production work of firms in the refrigeration field was the presentation to Crosley Corp.'s engineering department and its Primrose Plant 9 of the Naval Ordnance Development Award for their contribution to the development and manufacture of the highly secretive "variable time fuze" projectiles. Receiving the award from Capt. George P. Kraker of the Naval Bureau of Ordnance are, left to right: L. M. Clement, vice president in charge of engineering and research; Mrs. Jean Menke, representing Primrose Plant employees; and R. C. Cosgrove, vice president and general manager.

## WILLY TO HEAD PHILA. GROUP

Albert E. Willy, of Engineering & Refrigeration, Inc., was recently elected president of the Philadelphia Commercial Refrigerator Sales Association for the coming year. He succeeds W. L. Bissinger.

Jacob Gruhler, of Gem Mfg. Co., was named vice president; Morris Denkin, American Refrigerator Co., secretary; and John J. Donohue, of J. J. Pocock, Inc., treasurer. Directors include Jesse Popke, Judson C. Burns, Inc.; Thomas Gafferty, Pierce-Phelps, Inc.; A. C. McFadden, Seeger-Sunbeam Corp.; Howard Miltine, Royal Refrigerator Co., and Isadore Fogel, Fogel Refrigerator Co.

## ECONOMY PUMPS BUYS KLIPFEL MFG. CO.

Purchase of the stock of Klipfel Mfg. Co., Chicago, by Economy Pumps, Inc., Hamilton, Ohio, has been announced by the two firms, both of which are producers of regulators, controllers, and valves for fluid flow regulation.

J. H. Swan, president of Klipfel, remains with the company in an advisory capacity and as chairman of Klipfel's board of directors.

## UPRIGHT FREEZER SHOWN BY NORGE

An upright home freezer and five newly-styled refrigerators were introduced by the Norge division of Borg-Warner Corp. coincident with the opening of the Summer Furniture Market in Chicago. These new products are all in addition to the company's standard models which have been shown or announced previously.

The vertical freezer is of 7 cu. ft. capacity and will hold approximately 240 lbs. of frozen foods. The interior is divided into six compartments for simplified storage arrangement and reduced cold loss. In exterior appearance it is similar to the 7 ft. Norge refrigerator. Three chest-type freezers were also shown.

In one of the five new refrigerators, frozen food storage is provided for with a compartment which extends down one side of the interior. This compartment will hold the equivalent of 32 lbs. of frozen foods while permitting ample space for ordinary cold storage of other foods. Through placing this frozen storage compartment on one side, Norge engineers feel they have allowed for more flexible shelf arrangement and consequently greater bottle and bulky article storage.

## KRAMER TRENTON CO. MOVES OFFICES

Kramer Trenton Co., manufacturer of heat transfer products, has completed the expansion of its production facilities by moving its general offices from the Brunswick Ave. plant of the company in Trenton, N. J. to the Olden Ave. plant in the same city.

Relocation of the offices will consolidate the engineering department research laboratory and general offices at one location while at the same time making more space available for manufacturing at the Brunswick Ave. plant, all of which will be devoted to coil production. Forced convection units, Thermo-bank automatic defrosting systems and other products of the company will be manufactured at the Olden Ave. plant.

## KRAMER TRENTON PRICES RAISED

Effective June 26, Kramer Trenton Co. has announced increased prices on the products covered by its price list P-105. Prices generally are increased by 15%, with some special type coils increased about 30%. List prices on the Kramer "Thermobank" also are increased 15%. All shipments made on and after June 26 carry the revised prices. The increase

was authorized by OPA order SO 129, Amendment 30.

## CARRIER NOW MAKING 30 CU. FT. FREEZERS

Production of Carrier Corp.'s 30 cu. ft. food freezer is now under way, according to announcements by the company. Originally scheduled for production last February, manufacture of this unit was delayed for some time by material shortages.

## APPLIANCE RESEARCH



Kitchens, laundries, living quarters, and gardens of this palatial million-dollar Italian Renaissance residence have been converted by Monitor Corp. into a research center for testing and developing new household appliances. Known as Monitor House, this imposing edifice overlooks the Hudson River and has all the seclusion of a country estate, less than 30 minutes from New York City.

## TRUCK COOLING FIRM OPENS COAST OFFICE

As part of a nation-wide expansion program, U. S. Thermo Control Co., Minneapolis manufacturer of "Thermo King" truck refrigeration units, has announced the opening of a sales and service headquarters in Los Angeles.

"The volume of perishable freight carried on the west coast is so great," claims M. B. Green, sales manager, "we believe the Los Angeles office will be the busiest in the country."

Located at 2011 East 65th Street, the fully equipped shop under the supervision of James Breslin will be capable of giving complete service on Thermo King units. In charge of sales in the area is Gar Hastings, well known to the west coast trucking industry.

## K. C. WHOLESALER DOUBLES SPACE

Refrigeration Equipment Co., Kansas City (Mo.) supplies wholesaler, has recently acquired the other half of the building it now occupies, providing double its former space and greatly increasing office and display facilities, E. L. Tramposh, president, reports.

The company also has built a new warehouse building adjoining its present location, and provided a parking lot for customers. The warehouse will provide an additional 2500 feet of storage space.

Washer parts division of the company will remain at 1430 Walnut St., carrying a complete line of washer parts for all makes. C. R. Jones is manager of this division.

The Wichita (Kan.) branch of Refrigeration Equipment Co., at 302 N. Main St., is operated as a separate Kansas corporation.

## LOW PRICES SET ON PHILCO FREEZERS

Prices of \$149.50 for the AH25 2 1/2 cu. ft. model and \$199.50 for the AH51 5 cu. ft. model have been set on the home freezers manufactured by Philco Corp. as part of its long-range program to bring frozen food storage within the reach of every home.

Orders for 100,000 home freezers were placed by distributors and dealers even before the prices were set, according to the company.

## PHILA. WHOLESALER INCORPORATES FIRM

Victor Sales & Supply Co., which for years has operated as a Philadelphia wholesaler of refrigeration parts and supplies, has formally been incorporated as a Pennsylvania concern.

Officers of the corporation are: Alex J. Holcombe, Jr., president; Terrence L. McLaughlin, vice president and sales manager; E. B. Holcombe, secretary-treasurer; and Wm. J. Boyd, assistant sales manager. These four, together with Alex H. Holcombe, 4th, who has just been released from the Navy, constitute the board of directors.

There will be no change in the company's policies, according to the elder Mr. Holcombe, as this step was taken simply to secure the future of the business which has expanded so much in the past few years.

Coincident with the announcement of the firm's incorporation, Mr. Holcombe also revealed that the company is enlarging its present quarters to make room for additional storage space.

## LOVEJOY TAKES OVER IDEAL TRANSMISSIONS

Lovejoy Flexible Coupling Co. of Chicago has acquired in entirety the manufacture and sales of the mechanical power transmission department of Ideal Industries, Sycamore, Ill.

The products that pass to Lovejoy are: Ideal variable speed pulleys, adjustable motor bases, "Select-O-Speed" transmissions, Ideal drive sheaves, and stock of wide V-belts.

results in flooding during the "off" cycle and frosting back. Before replacing or removing the valve, try flushing the float to remove the dirt particle. This is accomplished by (1) closing the liquid valve on the receiver or in the liquid line at the condensing unit; (2) pumping down the line and float for about 15 minutes to open the valve wide; (3) raising the head pressure by blocking off the condenser; (4) then opening the liquid line valve quickly, the rush of refrigerant past the needle generally serving to dislodge the particle and carry it away from the seat. It may sometimes be necessary to repeat the operation if first flushing doesn't remove the dirt.

#### Inspecting the Screen

If liquid will not flow in to an evaporator fast enough through a low side float to close it off, the cause may be due to restriction or plugging of the screen located in the liquid line valve at the float. To inspect the screen, evacuate the liquid line to the float valve by closing off the receiver valve on the condensing unit and running the machine. Close the liquid line valve at the float after evacuating the line, and remove the  $\frac{1}{4}$ " inlet flare assembly which contains the float valve screen. Inspect the screen and blow out or replace with a new connector-screen. Reconnect the liquid line, and purge out the line before final tightening of the coupling nut.

If the screen is completely plugged, it may be impossible to evacuate the line. In this case, close the receiver valve and the float inlet liquid valve, and crack the flare nut, purging off the liquid refrigerant in the line. Be sure to protect the eyes against the escaping refrigerant during this operation.

#### Replacing Float Valve

To replace a float valve on an operating system, first be sure that new gaskets and all necessary tools are at hand to permit the work being done with minimum delay and minimum exposing of the system to the atmosphere.

Close the liquid line valve at the receiver and the liquid and suction

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Catalog MU-40

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M46-19

**Wagner**  **Electric**

valves on any other boilers in the system. Attach a compound gauge to the compressor suction service valve. Start the condensing unit, and block the switch closed to keep the machine running and completely evacuate the "boiler."

When the compound gauge reads a good vacuum (20") stop the compressor for a few minutes. If the vacuum holds, the "boiler" is probably empty. If the pressure rises, run the machine again. If after several trials, the gauge still rises the

flapper valve may be leaking back.

In this case, close the discharge service valve after stopping the machine and if the vacuum then holds, the evaporator is dry. Open the liquid valve slightly and raise the pressure to about 1 lb. Close the liquid and suction line valves on both the evaporator and the condensing unit.

Equip the new float valve with a header gasket and remove the shipping clamp (spacer strip). Have a new suction line valve gasket ready for use.

If the float valve has been out in a cold car or truck, be sure to warm it up before unpackaging it or installing it, to prevent moisture or condensation from collecting on the float.

Wipe the front of the evaporator dry, as well as all connections around the "boiler," before attempting to remove the old float. Loosen the suction valve cap screws and remove the float suction valve with the line attached. Remove the liquid line flare nut, plug it and bend it downward so that there will be no possibility of moisture dropping into it.

Remove the header cap screws around the float valve flange. Using one of the suction line valve bolts as a jackscrew, screw it into the hole in the upper edge of the float valve header and remove the float.

Quickly insert the replacement float valve and the flange capscrews, drawing up slightly on each in rotation until the new lead flange gasket is forced into a tight seal. Replace the suction valve and tighten the four capscrews evenly until the gasket seals tightly.

Do not pull up too hard on the

**THESE ARE ALL THE  
MOTOR-START CAPACITOR  
REPLACEMENT TYPES I EVER  
NEED!**



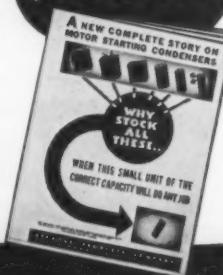
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Quick, easy to install!  
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capscrews, as they may break or you may shear the gasket.

Reconnect the liquid line and purge both the liquid and suction lines. Open the suction line on the compressor and the suction and liquid line valves at the evaporator. Open the receiver liquid line valve slightly and build the pressure up to 20 lbs. or more and test thoroughly for leaks at the header.

If the system is tight, open the liquid line valve at the receiver, start the machine and after a few minutes operation, check for refrigeration at



the "boiler" and check the compound gauge reading. If the pressure is reducing and the header is becoming cold or frosting, the float is working. Remove the gauge, and open all valves on the other floats in the system.

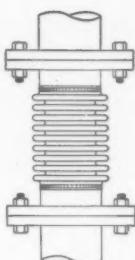
Remove all traces of oil from the evaporator header and replace the insulation pad in the "boiler" opening, if in the ice cream section.

Package the old float and return it to your shop or supply company for re-operation.

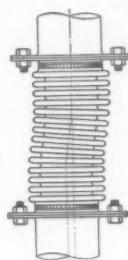
*(Refrigeration complaints in connection with soda fountain and ice cream installations will be discussed in next month's article in this series.)*

#### GENERAL CONTROLS ADDS TO NEW YORK STAFF

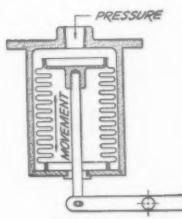
F. E. Weldon and A. C. Kelterborn have been added to the New York City factory branch sales staff of General Controls Co., Glendale, Calif. controls manufacturer.



Expansion Joint



MOVEMENT



PRESSURE



MOVEMENT

Compensator for Headers



#### C. M. H. STAINLESS STEEL BELLOWS

*Assure*

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low maintenance**

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C. M. H. Bellows, for example, with a working range of sub-zero to a scaling-point of 1800° F. are not bothered by temperatures . . . hot or cold. In addition, they have multiple-ply construction for greater strength; ferrous fittings, attached by Circular Seam Welding to insure leakproof joints; uni-metal assemblies which avoid troubles often encountered when bi-metal or solder joints are used. These and other features warrant your consideration. Write for Bulletin SS B-46.

#### Flexible Metal Hose for Every Industrial Use



**CHICAGO METAL HOSE CORPORATION**

**MAYWOOD, ILLINOIS**

Plants: Maywood and Elgin, Ill.



**COMFORT COOLING . . .**  
Continued from page 27

ventional design, and that a factor of  $1\frac{1}{2}$  to 2 air changes per hour be used when a room is exposed on more than two sides, and for stores and shops. The amount of air entering through infiltration per hour will be equal, therefore, to the cubic volume of an enclosure multiplied by the factor selected for the number of air changes per hour.

The heat load due to outside air may be calculated from Formula III.

Inasmuch as the heat content of air is approximately constant as long as its wet-bulb temperature remains constant, this value for the outdoor and indoor air may be read from tables of heat content of air at various wet-bulb temperatures. (See Table I). Or, the values of heat content may be determined directly from the psychrometric chart. (See Figure I.) The value for the specific volume of air is taken as the value given at the dry-bulb temperature of the outdoor air. (See Table II). An example or two will make this clear. [Note: The ta-

bles given here are of necessity abbreviated. For complete tables, see the ASHVE "Guide."]

(1) Given: *Outdoor design conditions—95 F dry-bulb, 75 wet-bulb; indoor design conditions—80 F dry-bulb, 67 F wet bulb. Outdoor air capacity is 10,000 CFM. Calculate the refrigeration capacity required to cool the outdoor air.*

From the table of heat contents of air (Table I), we find that air at a 75

TABLE I

**Heat Content of Air at Various Wet-Bulb Temperatures  
Barometric Pressure: 29.92 in.**

Wet-Bulb Temp., F.	Btu lb. of Dry Air in Mixture
50	20.26
52	21.40
54	22.56
56	23.80
58	25.07
60	26.40
62	27.80
64	29.25
66	30.75
67	31.54
68	32.34
70	33.98
72	35.75
74	37.55
75	38.50
76	39.48
78	41.45
80	43.55
82	45.78
84	48.10
86	50.52
88	53.07
90	55.78
92	58.60
94	61.59
96	64.72
97	66.35
98	68.01
100	71.48
105	81.10
110	92.04

F wet-bulb has a heat content of 38.5 Btu per pound, while air at a 67 F wet-bulb temperature has a heat content of 31.5 Btu per pound. The specific volume of air at 95 F is given in Table II as 14.0 cubic feet per pound. Substituting in Formula III, we have

$$\text{Btu per hour} = \frac{10,000 \times 60 \times (38.5 - 31.5)}{14} = 300,000$$

(2) Given: *Outdoor design conditions—100 F dry-bulb, 20% relative humidity; Indoor design conditions—82 F dry bulb, 49% relative humidity; Outdoor air capacity is 10,000 CFM. Calculate the*



\*When asked the question, "What type and brand drying agent do you use?" . . . 91% of the service engineers who specified a brand said . . . "DAVISON Refrigeration Grade SILICA GEL." This amazing fact was revealed in a survey of service men in all parts of the country.

This is a good time to follow the leader. Your jobber stocks Davison Refrigeration Grade Silica Gel . . . in factory-charged dehydrators and for refilling. ASK FOR IT BY NAME.

LOOK FOR THE CAN WITH THE BLUE LABEL

**THE DAVISON CHEMICAL CORPORATION**  
*Progress through Chemistry*

Canadian exclusive sales agents for DAVISON SILICA GEL:  
CANADIAN INDUSTRIES LIMITED, General Chemicals Division

refrigeration capacity required to cool the outdoor air.

From the intersection of the 100 F dry bulb line and the 20% relative humidity curve on the psychrometric chart (Figure I), we find that the wet bulb temperature is 70 F, representing a heat content of 34.0 Btu per pound. Likewise, from the intersection of the 82 F dry-bulb line and the 49% relative humidity curve, the wet-bulb temperature is determined as 68 F, representing a heat content of 32.3 Btu per pound. The specific volume for air at 100 F is given in Table II as 14.1 cubic feet per pound. Again

TABLE II  
Specific Volume of Dry Air  
at Various Temperatures  
Barometer: 29.92 in.

Temp., F	Lbs. of Air per Cu. Ft.
0	11.59
10	11.85
20	12.10
30	12.35
40	12.60
50	12.85
60	13.10
65	13.22
70	13.34
75	13.48
80	13.60
85	13.72
90	13.85
95	13.98
100	14.11
110	14.35
120	14.60
130	14.85
140	15.11
150	15.36
160	15.62
170	15.86
180	16.12
190	16.38
200	16.62

substituting in Formula III, we have

$$\begin{aligned} \text{Btu per hour} &= \\ & \frac{10,000 \times 60 \times (34.0 - 32.3)}{14.1} \\ &= 72,300 \end{aligned}$$

HEAT GIVEN OFF FROM PEOPLE: We have already noted that the average person at rest gives off about 400 Btu per hour, approximately 40% of which is latent heat necessary to evaporate from 800 to 1,400 grains of moisture per hour.

For people doing light work, the heat given off will rise to 600-700 Btu per hour, with the latent load increasing to approximately 70%, representing the evaporation of 3,000-4,000 grains of moisture per hour.

HEAT GIVEN OFF BY OTHER FACTORS: Other factors which add heat to an enclosure are (1) electric lights, (2) electric motors and appliances, (3) natural or manufactured gas burned, (4) special kitchen equipment. The heat equivalents of these various items are given below.

Electric lights 3400 Btu per and appliances. Kwh.

Electric motors . . . . . 3000 Btu per HP/hr.

Natural gas . . . . . 1000 Btu plus 1 lb. of moisture per cu. ft. consumed.

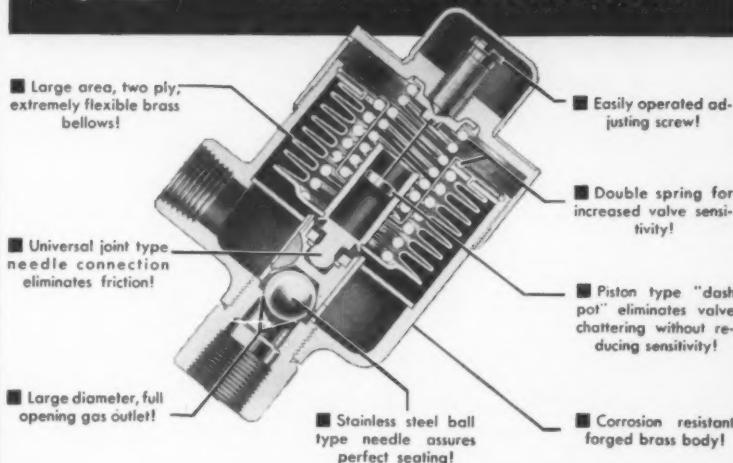
Manufactured gas . . . . . 600 Btu plus .06 lb. of moisture per cu. ft. consumed.

10-Gal. coffee urn . . . . . 10,000 Btu per hr. plus 5 lbs. of moisture.

Steam table . . . . . 1000 Btu per hr. per sq. ft. plus 1 lb. of moisture per hr.

If the appliance is hooded and vented to the outside, reduce these values by 50%, and assume that approximately 90% of the moisture is lost to the outside.

TAKE A GOOD LOOK AT  
**TEMPIRE'S**  
**TWO TEMPERATURE VALVE!**



■ Sensitive operation, perfect sealing seat, large capacity and rugged construction! These are the features that have made Temprite Two Temperature Valves "tops" in the constant pressure valve field.

Competitively priced in four standard sizes, they are available for immediate delivery. Write today for full particulars on these valves and also the complete line of Temprite quality products.

### OTHER TEMPIRE QUALITY PRODUCTS



### TEMPIRE PRODUCTS CORP.

Originators of Instantaneous

80° 40°

Liquid Cooling Devices

41 PIQUETTE AVENUE

DETROIT 2, MICHIGAN

**CONTRACTOR . . .**  
Continued from page 30

security and other taxes. This may not be the most important reason for keeping good accounting records, but it certainly is a very necessary reason for keeping them. In fact, the law says you **MUST**.

3. At the end of the year, perhaps you know that you have made money because you are worth more than you were at the beginning of the year,

and that's a pretty good way of telling whether you have made a profit. But do you know your costs? Do you know on which jobs you made your profit?

If you are the type of contractor who has several jobs running at one time, you may be losing on some and making on the others, and never know the difference, because at the end of the year you know that you have made money. Just think what it would mean to you if you knew the *type* of jobs on which you lose money. You

could then revise your quotations or leave such jobs alone and make more profit.

4. Knowing your overhead expenses is absolutely essential. Overhead is a stumbling block over which two out of every three business failures have stumbled. Many a contractor started operating from his own home where his overhead was very small. He would add a percentage to each estimate to take care of his profit, and that was that.

Later he broadened out. He opened up a place of business. He had rent, telephone, clerical and other expenses. Perhaps he had one or many trucks or delivery wagons. Obviously he had to get these overhead expenses back in one way or another.

Maybe *you* are that contractor. If so, maybe you figured that the increased volume of business which you were able to do more than covered your overhead. Maybe it did. But if you don't know, you are a speculator, not a business man. If you are still the small operator who has no overhead, you should still keep your records in a business-like way—it may

# laykold

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## INSULATION ADHESIVE

### USED COLD

#### No Heating   No Fires   No Hazards

Both owners and contractors lose more than insurance covers, if fire breaks out on an insulation job. Months of building usage are lost—critical materials wasted.

LAYKOLD Insulation Adhesive is asphalt formulated for cold use. It contains no inflammable solvents and will not ignite. It holds vapor-seal membranes and insulation materials to any type of surface. Combined with aluminous cement, it adheres to damp walls or floors where other adhesives won't stick.

Cover the floor with LAYKOLD Mastic—impervious, easy-to-clean, enduring, waterproof and noiseless—no better refrigeration job can be built.

Play safe with Laykold Products—no fires, no fumes, no stench, no odors.  
Specifications and prices on request.

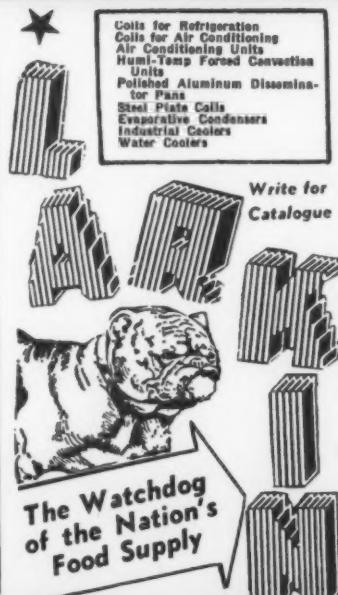
\*Reg. U. S. Pat. Off.

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#### REFRIGERATION PRODUCTS



LARKIN COILS  
519 Memorial Dr., S. E.  
ATLANTA, GA.

be the means of your getting big. You may be one of those individuals who love to gamble, and take a chance once in a while, and prefer to do business that way, and you may be fortunate enough to get by with it for an indefinite period of time.

Some men are lucky enough to operate on that basis, but even if you are that type of man, Uncle Sam says you must keep certain records for the well-known tax reasons, so why not keep proper records which mean something?

5. Being a good manager and making the right decisions is not difficult if you have all the facts. Here's an example: We know a contractor who owned and operated a truck for delivering materials to jobs. A dependable trucker made him an offer to buy the truck and deliver his materials at so much for each delivery.

This contractor referred to his records, saw he would save more than \$100 per month by the new arrangement. He knew the new arrangement would be very satisfactory; it was easy for him to make a decision.

If he had not had information which showed him the cost of operat-

ing his truck, he probably would have gone along as he had been doing, feeling that he was a very good manager, indeed.

You are going to have a sharp upward curve in business. That you may also have a sharp upward curve in profits is one of the purposes of a sound accounting system. It can contribute much toward giving you full knowledge of your business.

With "full knowledge" you can have "full control" which means *profits*—not headaches; *black* figures, not *red*.

for TEMPERATURE\*  
for MOTOR OPERATION\*

2 Recorders\*

for LESS than the  
PRICE of ONE



The TEMPScribe Recorder is outstanding for its universality. Any TEMPScribe can be quickly converted from temperature recording to time-operation recording simply by changing the door of the instrument. One clock case (having a 24-hour spring-wound movement) and two doors (one with a bi-metallic temperature element, and one with mechanism for recording motor on-and-off time) give you all the advantages of two separate instruments, yet cost less than you would normally expect to pay for a single instrument that makes dual records!

Popular TEMPScribe styles: Temperature Ranges—minus 10° to plus 50°F. for cabinet temperature, and 40° to 100°F. for room temperature; and Motor Operation mechanism for series connection up to 250 volts. Other styles are listed in Leaflet 712.

Ask Your Wholesaler

**Bacharach** INDUSTRIAL INSTRUMENT CO.  
7000 BENNETT STREET, PITTSBURGH 8, PA.

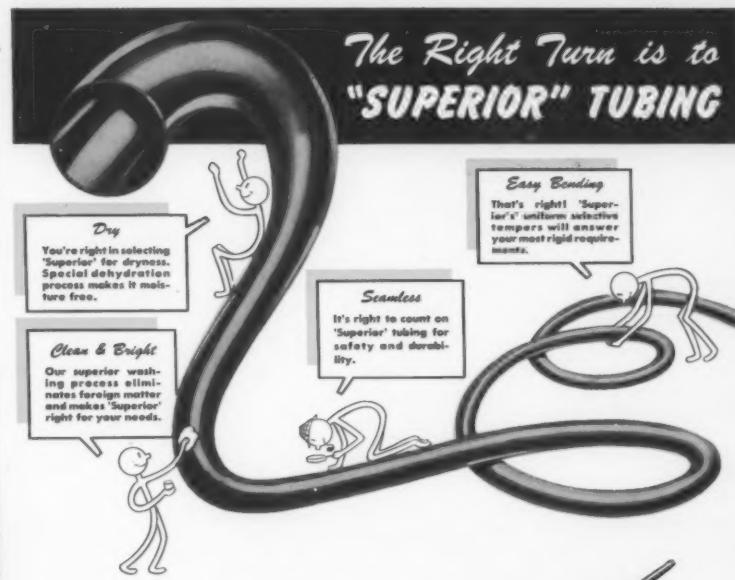
AUGUST, 1946

## NEW L.A. REFRIGERATION FIRM INCORPORATES

Articles of incorporation have been filed in Los Angeles by ABC Refrigeration & Appliance Co., Inc., with an authorized capital of \$200,000 represented by 20,000 shares of \$10 par value.

Incorporators are Erasmo Cantabene, John Cantabene, Benjamin Goodman, George W. Collins, all of Los Angeles, and John M. Shrote of Burbank, Calif.

## "SUPERIOR" TUBING 4 WAYS BETTER



Many of our old customers and countless new ones are making the "Right Turn" to Penn's "Superior" tubing. They realize the quality and workmanship that we apply to our drawing and annealing process to give each individual customer satisfaction. Your problems are always welcome at Penn—make the "Right Turn", write today!

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## Fitted to that job...

• Whether you choose an Aerovox Universal (utmost convenience) or an Exact-Duplicate (perfect match) type for that motor-starting capacitor replacement, you are assured that it will definitely fit the job.

The latest Aerovox catalog contains the most extensive listings and cross-indexes yet issued. Yes, it's easy—and safe, too—to select the right Aerovox replacement for any capacitor-start motor. Why take chances?

### • See Our Jobber . . .

He can help you choose the right Aerovox replacement for any standard capacitor-start motor. Ask to see the latest Aerovox catalog. Or write us.



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## Over the COUNTER

WITH this issue, we conclude our review of the developments in the refrigeration field which led to the growth of the independent parts wholesaler to his present importance. Previous articles in this series were published in the June and July issues.

THE tie-up between the independent manufacturer, jobber and service-man-dealer was a happy one, and all three groups in this arrangement started to expand, with new products and new fields open to all. This greatly expanding industry developed new products, new methods and new equipment rapidly during the 30s.

The jobber no longer confined his sales to independent dealers and service men, but began to find ready markets for many of the hundreds of items he handled with the ice cream manufacturers and large industrial users of refrigeration equipment, who, because of their great investment in refrigeration equipment, employed their own mechanics to install, service and repair the refrigeration equipment owned by them.

Refrigeration contractors looked to the jobber to supply many accessories and supplies used by them in the creation of refrigeration and air conditioning plants. The same condition developed with distributors of fixtures and condensing units, together with small local assembly manufacturers, who usually sell their products direct to the consumer in a localized area.

Many items now handled by the wholesaler were purchased by franchised distributors and dealers where the parent manufacturer did not supply the item required.

The wholesaler, his business steadily expanding as new fields opened to his activities by this time, not only carried large, diversified stocks of equipment, accessories, parts and supplies, but in many instances found

urgent need and demand from his customers to sell complete unit equipment such as ice cream cabinets, drinking water coolers and systems, portable air conditioning units and many other similar systems.

The jobber (or wholesaler, as he now calls himself) can in most instances furnish any and all types of complete unit equipment, accessories, parts and supplies covering the entire range of the industry. In many wholesalers' organizations trained and dependable refrigeration engineers are available to make a complete installation layout of the entire equipment needed to properly handle a complete refrigeration project.

Between 200 and 300 wholesalers are strategically located throughout the entire country, Canada, Mexico



"This may be old fashioned, Ma'am, but it's stood the test of time."

and in foreign countries, including Australia and New Zealand, with warehouses stocked with merchandise for fast service to the entire refrigeration trade.

Because of the fact that refrigeration is essential for the storage and preservation of all food and other products of a perishable nature, the entire refrigeration industry is geared

to provide needed items on short notice.

*The wholesaler, specializing in warehousing materials needed in this industry on the spot, so to speak, has earned a definite place in the industry by being constantly on the job with materials for fast handling when needed.*

Wholesalers' salesmen, regularly contacting the trade, help keep these factors of the industry informed on new products, price changes, and general trade information.

*With widely diversified wholesalers' inventories to draw on, contractors, distributors, dealers and service men have been able to handle ever-increasing volumes of business with a limited amount of working capital tied up in a general run of materials, as such materials are quickly available through the wholesaler.*

The varied services and functions of the wholesaler have provided a very important cog in the refrigeration distribution machinery, both in war and in peace.

UNCLE SAM'S big "underground refrigerator" at Atchison, Kan., is reported by officials to be operating on a paying basis.

Delbert V. Case, manager of the giant \$2,000,000 project in an old limestone mine, said the cooler had been "definitely in the black" since April 1, although only 10% of its 52,000-ton storage capacity was being used.

The underground refrigerator, under the direction of the shipping and storage branch of the Department of Agriculture, was given a chance to prove itself in the face of congressional criticism by Secretary of Agriculture Clinton Anderson last fall. Food for UNRRA and various government programs now is stored in the cooler.

With 15 acres of floor area, the cooler is rated as the world's largest single storage on one floor.

#### PHILA. SCHOOL ADDS COURSE IN COOLING

Refrigeration and oil burner service training, initiated as a wartime measure by the Electrical Association of Philadelphia, has been added to the regular curriculum of the Murrell Dobbins Vocational School, Philadelphia. At present 68 veterans are enrolled in the refrigeration course, which is approved by the Veterans Administration and recognized by the G.I. Bill of Rights.

The refrigeration course lasts two and a half years and is divided into

five class periods per week. Two classes are held daily from 8 A.M. to 1 P.M. and two others from 1 to 6 P.M.

#### ST. LOUIS WHOLESALER EXPANDS QUARTERS

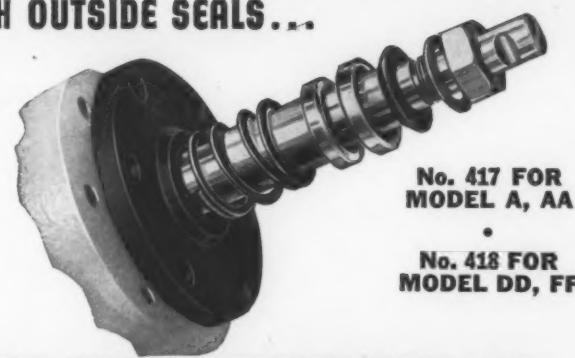
A contract for an addition to its present buildings has been let by Brass and Copper Sales Co., St. Louis wholesaler of refrigeration parts and supplies. This addition, which is expected to be completed by early fall, will provide 8,500 sq. ft.

of warehousing space and 3,500 sq. ft. of office space.

#### 'INTERIM' PRICE POLICY BY SYRACUSE WHOLESALER

Because of the uncertainties of the present price situation regarding refrigeration parts, Central Service Supply Co., Syracuse, N. Y., wholesaler, has advised its customers that until further notice all merchandise will be shipped according to approved prices existing on the day of shipment.

# Now 2 New Model CHICAGO SEALS for USE ON UNIVERSAL COOLER COMPRESSORS WITH OUTSIDE SEALS...



No. 417 FOR  
MODEL A, AA

No. 418 FOR  
MODEL DD, FF

FOR BETTER PERFORMANCE USE

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# MECHANICAL Canary!



In mining — the canary is used as a gas detector. In refrigeration — the LENK Halide Leak Detector locates dangerous leaks.

The Non-Clogging Burner and the Self-Cleaning Orifice make the Lenk Halide Leak Detector easy to use — easy to maintain.

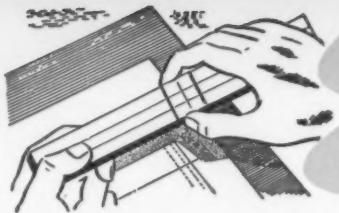
Excellent as a high-heat blow torch, too. Any way you look at it, Lenk's the best buy!

• SAFE

• SURE

• ECONOMICAL

Address: Post Office Box 8-R



## New PRODUCTS

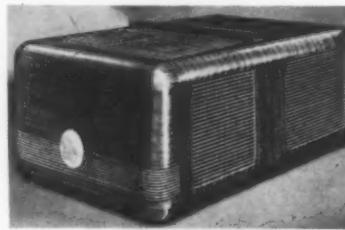
For further information on any of these products, simply list the key number at the head of each item on the special post card enclosed with this issue.

### Window Cooler • • • P-109

**Product:** A self-contained room air conditioning unit which cools, filters, de-humidifies, and ventilates.

**Manufacturer:** Pacific Mfg. Corp., Cleveland.

**Features:** Twin cylinder, hermetically sealed, 1/2-hp. compressor, with



the condensing coil, is located in the section of the cabinet outside the window. Room section contains filter, cooling coil, outlet duct, and motor-driven fan. Cabinet insulated with 1 inch of "Fiberglas." Air filter easily accessible through removable cover on the front. Unit is controlled thermostatically. Switch permits use of fan independently if desired.

### Flareless Fittings • • • P-110

**Product:** Fitting for use in joining all types of metal tubing in hydraulic and fluid-conveying systems.

**Manufacturer:** Parker Appliance Co., Cleveland.

**Features:** Eliminates need for spe-



cial flaring and assembly tools, also brazing and soldering. The fitting

incorporates a steel ferrule which, when body and enclosing nut are tightened up, acts to cut a shoulder in the tubing itself, thus providing a strong, tight sealing grasp for the assembly. Only tubing preparations necessary are square cut-off and removal of burrs. Joint may be broken at any time without affecting resealability. Available initially in 1/4 to 1 in. o.d. sizes in all conventional shapes and materials.

### Home Freezer • • • P-111

**Product:** Home freezers, in 20 and 30 cu. ft. sizes.

**Manufacturer:** McAbee Industries, Pittsburgh, Pa.

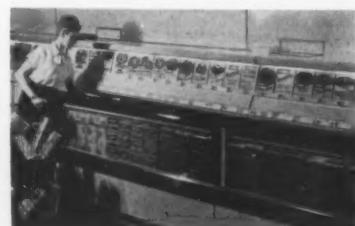
**Features:** The two models are insulated with 6 inches of Fiberglass and are described as "custom built". Cabinet, of 14-gauge cold-rolled steel, with arc-welded joints, is finished in baked-on enamel. No data is given as to compressor sizes.

### Frosted Food Case • • • P-112

**Product:** Model 84-FF self-service, large capacity frosted food case for retailers.

**Manufacturer:** C. V. Hill & Co., Inc., Trenton, N. J.

**Features:** Automatic defrosting.



Construction designed to permit placing of any number of units together, eliminating usual in-between ends. Uniform temperatures maintained by "curtain" of cold air across service opening. Display section and picture board are illuminated by separate sets of concealed lights. Individual case measures 7 ft. 8 in. in length.

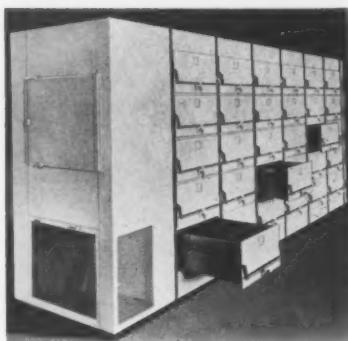
and has capacity of approximately 700 packages.

#### Locker Unit • • • • P-113

*Product:* Thirty-drawer frozen food locker unit for small commercial applications.

*Manufacturer:* Iceberg Refrigerated Locker Systems, Inc., New York City.

*Features:* Drawers on one side



only, permitting unit to be placed against wall. Top-suspended, 6 cu. ft., double roller bearing drawers, self sealing to prevent leakage. Exterior finish is white baked-on enamel; interior finish is aluminum.

## 10 DAY SERVICE GENUINE GRUNOW PARTS



11284-5 Carrene  
Meter (list) \$11.50



9851-A Hodulair  
Condenser (list)  
\$11.00



Stator  
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1004 Frost Meter  
(list) \$8.00



10108 Thermostat  
(list) \$9.00



Carrene No. 1 (list)  
\$8.00 per gallon in  
10 gal. tote

**Grunow**  
AUTHORIZED SERVICE, INC.  
4315 W. Fullerton Avenue, Chicago 39, Illinois

#### Home Freezer • • • • P-114

*Product:* Upright type home freezer.

*Manufacturer:* Pacific Electrical & Mechanical Co., Seattle, Wash.

*Features:* Present upright model has 12 cu. ft. storage space; an 8 cu. ft. unit is also planned. The 12-ft. model is divided into four compartments, with top and bottom compartments providing zero temperatures, two center compartments providing -10 F.

Two inner doors are provided for additional insulation. Interior is in-

sulated with 5 inches of fiber glass. Experimental tests are now being made, with view to adding walk-in and freezer combination units.

#### Circulating Fan • • • • P-115

*Product:* Axial flow fan for exhaust ventilation and cooling.

*Manufacturer:* The Moore Co., Kansas City, Mo.

*Features:* Made of corrosion resistant Monel metal for handling damp or corrosive vapors, or of cold rolled steel for ordinary exhaust



Marsh Instruments—the heart of the tool kit.



Compound gauge—made in ranges of 30"x15 lbs., 30 lbs., 60 lbs., 100 lbs., 150 lbs., 200 lbs., 300 lbs.



Marsh Serviceman—capillary tubing is neatly coiled in case when not in use.

## MARSH Instruments

The diagnosis of refrigeration ailments can be no more accurate than the instruments used in making it. In determining the troubles accountable for 95% of all servicing calls, the vital instruments are pressure gauges and thermometers, and the Marsh line offers you these instruments in the most accurate and usable forms.

In the Marsh "Serviceman" you have the handiest servicing thermometer ever developed. Its remote reading feature enables you to make determinations far more accurately than you can make them with a pocket thermometer—enables you to make readings under actual operating conditions with the refrigerator door closed and the indicator outside showing just what's going on at the point of measurement.

Marsh Refrigeration gauges are known for lasting accuracy—the ideal gauges for checking head pressures, suction pressures, and switch settings.

All Marsh Gauges are available with the Marsh "Recalibrator"—the quickest and best means ever developed to restore the accuracy of a thermometer or gauge that has been knocked out of adjustment. The "Recalibrator" is standard in the Marsh "Serviceman" thermometer.

#### Write for new Refrigeration booklet.

A new 20 page pocket-size booklet covers commonly used Marsh Refrigeration instruments. Where shall we send your copy?

**JAS. P. MARSH CORPORATION**  
2060 Southport Avenue, Chicago 14, Illinois  
Export Dept.: 155 East 44th Street, New York 17

**MARSH** *Refrigeration  
Instruments*

ventilation and cooling, in 3 to 5 ft. diameters. High slip, slow speed, direct drive motor makes possible mounting in any position. Guide vanes on inlet side of fan reduce tendency of air to corkscrew with rotation of blades. Large hub eliminates that portion of the blade which has a low peripheral speed and thereby voids possibility of a backflow of air through the center of fan.

**Refrigerant Condenser • P-116**  
Product: "Aero-Pass" condenser

for refrigerant gases.

*Manufacturer:* Niagara Blower Co., New York City.

*Features:* Automatic year-around operation intended to obtain economical operation of refrigerating machinery by constantly producing the lowest practicable head pressures at the compressor. Uses two condensing coils—a dry coil in which temperature of the gas is reduced close to the point of condensation; and a second coil sprayed with water which, as it is evaporated in a fan-induced air stream, reduces the gas tempera-

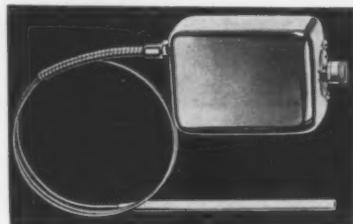
ture by 1000 B.T.U. per pound of water evaporated. Through a recirculating duct a varying amount of the air stream is diverted as necessary to obtain full condenser capacity.

**Thermostat • • • • P-117**

*Product:* Type O remote-bulb thermostat for industrial applications.

*Manufacturer:* United Electric Controls Co., Boston.

*Features:* For use with all liquids or gases or for metal-to-metal appli-



cations, and can be equipped with ambient temperature compensation. Thermal assemblies can be plated or supplied in stainless steel for applications injurious to brass. Can be adjusted by either knob and pointer with calibrated dial or by screwdriver. Calibrated adjustments cover any 120 or 250 F. in the range from -120 to 600 F. Screwdriver adjustments cover entire ranges from -120 to 180 F., from 50 to 350 F., or from 50 to 600 F. Four types of bulb are available.

**Fan Assembly • • • • P-118**

*Product:* Fan assembly for use in mobile air conditioning, heating, and ventilating systems.

*Manufacturer:* Evans Products Co., Detroit.

*Features:* Axial flow fan molded



from a heat and damage resistant thermo-setting plastic. Designed for

**HELPING YOU -**  
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You might say the VIRGINIA Refrigeration Equipment Wholesaler is your partner in business. On his shelves for immediate delivery are 4,000 different refrigeration items from more than 200 different manufacturers. He is a good man to know. Ask him about VIRGINIA Refrigerants—

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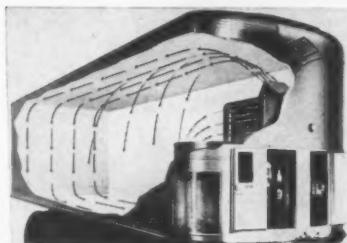
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installations where a large amount of air circulation is needed and where fan installation space and power source are limited. Weight is concentrated on hub, placing 50% less load on motor bearings, causing less inertia to overcome in starting, and increasing life of commutators and brushes. Available in sizes from 2 to 14 in. in diameter.

**Refrigerated Truck • • P-119**

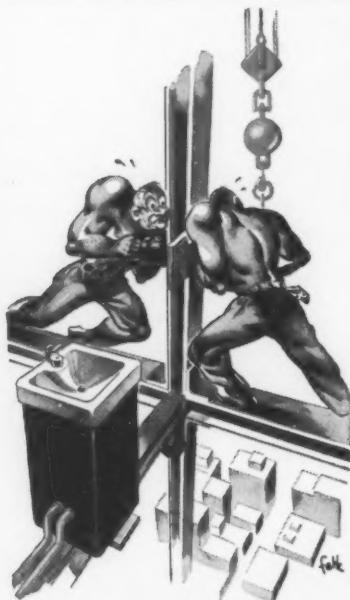
*Product:* Refrigerated and insulated truck body.

*Manufacturer:* Refrigeration unit,



Advance Mfg., Inc., Detroit; truck body, Fruehauf Trailer Co., Detroit.

*Features:* Stainless steel van with "Fiberglas" insulation. "Travel-Aire" refrigerating unit rated for tempera-



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tures down to 10 F. and holding constant temperature on pre-cooled products. Air circulated through the truck body at 1800 cfm.

**Cooling Unit • • • • P-120**

*Product:* Unit combining cooling and humidity for food storage.

*Manufacturer:* American Coils Co., Newark, N. J.

*Features:* Built to handle walk-in coolers. Performs each of its double functions on a separate stream of air, maintaining accurate control of air

conditions at all times. One stream taken in by the unit is completely treated for humidity; the other is controlled for temperature.

**Wire Stripper • • • • P-121**

*Product:* Model A-02 wire stripper.

*Manufacturer:* Holub Industries, Inc., Sycamore, Ill.

*Features:* Strips wide variety (No. 10 to No. 22) of solid or stranded wire without nicking wire or cutting strands. Clamps wire, cuts insulation, and strips it all in one operation.

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**NORTHERN INDIANA BRASS CO.**

ELKHART, INDIANA

VALVES AND FITTINGS SINCE 1904



**ABOUT PEOPLE . . .**  
Continued from page 34

tually, with a complete field organization.

**L. B. McGrew** has been appointed assistant manager in charge of warehouses for Williams & Co., Inc., refrigeration supplies wholesaler with headquarters in Pittsburgh, Pa., and branches in Cleveland, Cincinnati, Columbus, and Toledo, Ohio. Carl

**C. Kleinschmidt** has been named manager of the company's brass, copper, and aluminum department.

**Thoben Elrod** has been promoted to the position of southern regional sales manager for Deepfreeze Division, Motor Products Corp. Mr. Elrod, who formerly served the company as district sales manager, will make his headquarters in Atlanta.

**Walter L. Pharo** and **Philip B. Hoppin** have been named executive

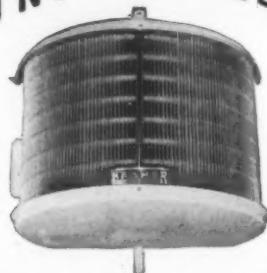
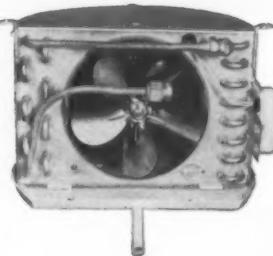
assistants to John R. Hertzler, general sales manager of York Corp. Mr. Pharo, a sales engineer in York's Atlanta district before the war, will work closely with other members of the company's sales planning department. Mr. Hoppin was associated with American Radiator & Standard Sanitary Corp. prior to the war.

**George K. Bently** has been named director of research and development for McCray Refrigerator Co., and in this capacity will direct all products research, development, and sales engineering. Mr. Bently has headed McCray's experimental laboratory for a number of years, and also has been a member of the sales and engineering departments.

After spending 2½ years overseas with the armed forces **S. Charles Segal** has returned to his position as chief engineer of the Kramer Trenton Co. Mr. Segal has long been a recognized authority in the refrigeration and air conditioning industry, and during the short period since he returned to the company he has given many talks to refrigeration organizations.



# The New KRAMER CURVETTE UNIT COOLER



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TRENTON 5

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NEW JERSEY

Seven new field appointments have been announced by Edison General Electric (Hotpoint) Appliance Co. New district sales managers include: **H. L. Cushing**, Dallas; **W. R. Hall**, Boston; **S. J. Houston**, New York; **D. H. Risher**, Charlotte, N. C.; **W. A. Summers**, Buffalo. New sales promotion managers are: **L. O. Braun**, eastern region; **W. W. Gibbs**, southern region.

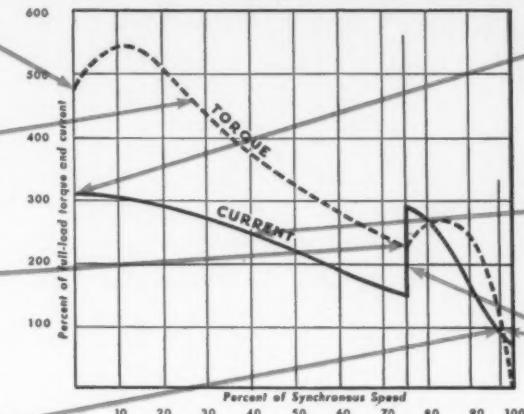
# This Chart Shows Why There's Such a Strong Preference for Wagner Repulsion-Start Induction Motors

Starting-torque of the RA motor is very high—at least 3½ times full-load torque for a 4-pole 60-cycle motor—enabling the RA motor to start high-inertia loads.

Torque output of the RA motor remains high during the starting period, assuring rapid and smooth acceleration of the load.

When the torque as a repulsion motor drops to that of an induction motor, the motor is changed from a repulsion motor to an induction motor by means of an automatic mechanism built into the rotor. During the pull-in period, the torque again rises—to more than twice the full-load torque.

Full-load torque is reached at 96% to 97% of synchronous speed. The speed decreases very little even under considerable overloads, a highly-desirable characteristic of the Wagner-type RA motor.



Typical speed-torque and -current curves of a Wagner Type RA repulsion-start induction motor. These curves show how the type RA combines the desirable features of the repulsion and induction types of single-phase motors, while it at the same time excludes their deficiencies.

Starting-current of the RA motor is lower than any other type of single-phase motor—approximately three to four times full-load current. Thus light-flicker is negligible when the RA motor starts.

Current-draw decreases rapidly and smoothly as the motor accelerates, remaining for lower than that of other types of single-phase motors.

At the change-over point where the RA motor is automatically changed from a repulsion to an induction motor, the current-draw increases—but to less than the starting-current—and then drops rapidly as the motor attains full-load speed.

The world over, Wagner type RA repulsion-start induction motors are in strong demand—and the preference for this type of motor is growing rapidly.

Fifty years ago, Wagner began building repulsion-start induction motors, and notwithstanding the development of other types of single-phase motors during the past half century, the repulsion-start induction type RA is still the preferred motor for a wide field of appliances and machines.

As the chart shows, the RA's electrical characteristics combine the best features of two types of motors: the repulsion motor while starting and the induction motor while running.

As a repulsion motor, the Wagner type RA has

1. a high starting-torque, enabling it to start high-inertia loads and accelerate them smoothly, and
2. the lowest starting-current of any type of single-

phase motor, therefore least likely to cause light flicker.

As an induction motor, the Wagner type RA has

3. fairly constant and high operating-speeds at all operating loads, even under considerable overload, and
4. a fairly flat efficiency curve over a wide operating range.

This versatile motor is not only exceptionally suited for use on practically every type of motor-driven appliance and machine normally utilizing single-phase current, but is also the *only* choice for wide variety of applications.

For complete information, write for Bulletin MU-185, and address your request to Wagner Electric Corporation, 6442 Plymouth Avenue, St. Louis 14, Missouri.

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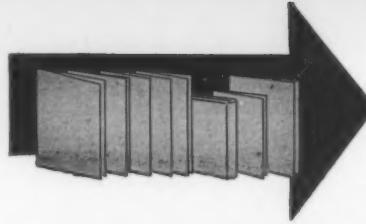
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R22



## Useful Literature

The publications listed below are available to readers without charge. Simply list on the postcard provided in this issue the numbers of the items you wish to receive, and send it to THE REFRIGERATION INDUSTRY, 1240 Ontario Street, Cleveland 13, Ohio. Your requests will then be forwarded directly to the companies concerned.

**329—Brazing Instructions** . . . A profusely illustrated 18-page bulletin (No. 12-A) presenting a wide range of informative material on low temperature brazing of metals with "Sil-Fos" and "Easy-Flo" silver brazing alloys. Also a separate instruction sheet for torch brazing with these same materials, describing and illustrating seven recommended steps in this process. Available from Handy & Harman.

**330—Indicating and Recording Gauges** . . . Catalog No. 520 illustrating the line of instruments produced by Weksler Thermometer Corp. for indicating and recording temperature, pressure, and humidity. This folder is intended as a temporary expedient pending completion of the company's new general catalog.

**331—Air Filters** . . . Three separate catalog sheets describing and listing tech-

nical data on the "Aircor" line of filters for average and heavy duty conditions and for greasy air. From Air Filter Corp.

**332—Oil Service Guide** . . . A folder specifying the recommended grade of "Sunoil" oil for use with a wide variety of refrigeration and air conditioning units, industrial refrigeration equipment, and also motors, fans, and bearings. Available from Sun Oil Co.

**333—Industrial Instruments** . . . A 40-page full-color catalog featuring complete descriptions and applications of the line of instruments and gauges manufactured for industrial uses by The Electric Auto-Lite Co., Instrument & Gauge Div.

**334—Micro Switches** . . . An 8-page bulletin (No. 34) describing, illustrating, and giving specifications of the line of small, precision, snap-acting switching units for electric mechanisms manufactured by Micro Switch Division, First Industrial Corp.

**335—Unit Cooler** . . . A new bulletin listing specifications and performance data on a radial unit cooler designed for commercial refrigeration applications. Available from Kramer Trenton Co.

### FOR MANUFACTURERS ONLY

**336—Solder Sample** . . . A test quantity of "Tri-Core" solder wire is offered free of charge to any manufacturers interested in learning at first hand the qualities of this new product. Alpha Metals, Inc.

### 337—Heating and Cooling Unit

A folder illustrating and briefly describing the "Marvair" year-around, automatic, electrically powered air conditioning unit. Available from Marvair Division, Muncie Gear Works, Inc.

### 338—Commercial Food Freezer

A new 4-page folder describing the completely automatic operation of the "Salematic" commercial freezing plant for food processors. Available from Salem Engineering Co.

### 339—Thermometers

Catalog No. 46 designed to facilitate the selection of the proper type of thermometer for any particular application. Information is given on ranges, dimensions, bulbs, and fittings of each type. Available from Gotham Instrument Co.

### 340—Gas Masks

A new 4-page bulletin describing and illustrating industrial gas masks for protection against individual industrial gases or combinations of gases, smoke, vapors, and dusts. Available from Mine Safety Appliances Co.



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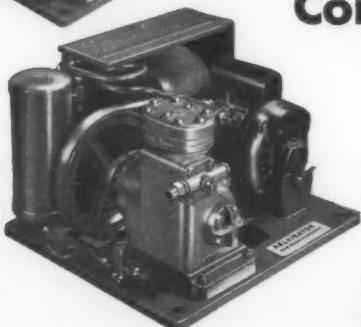
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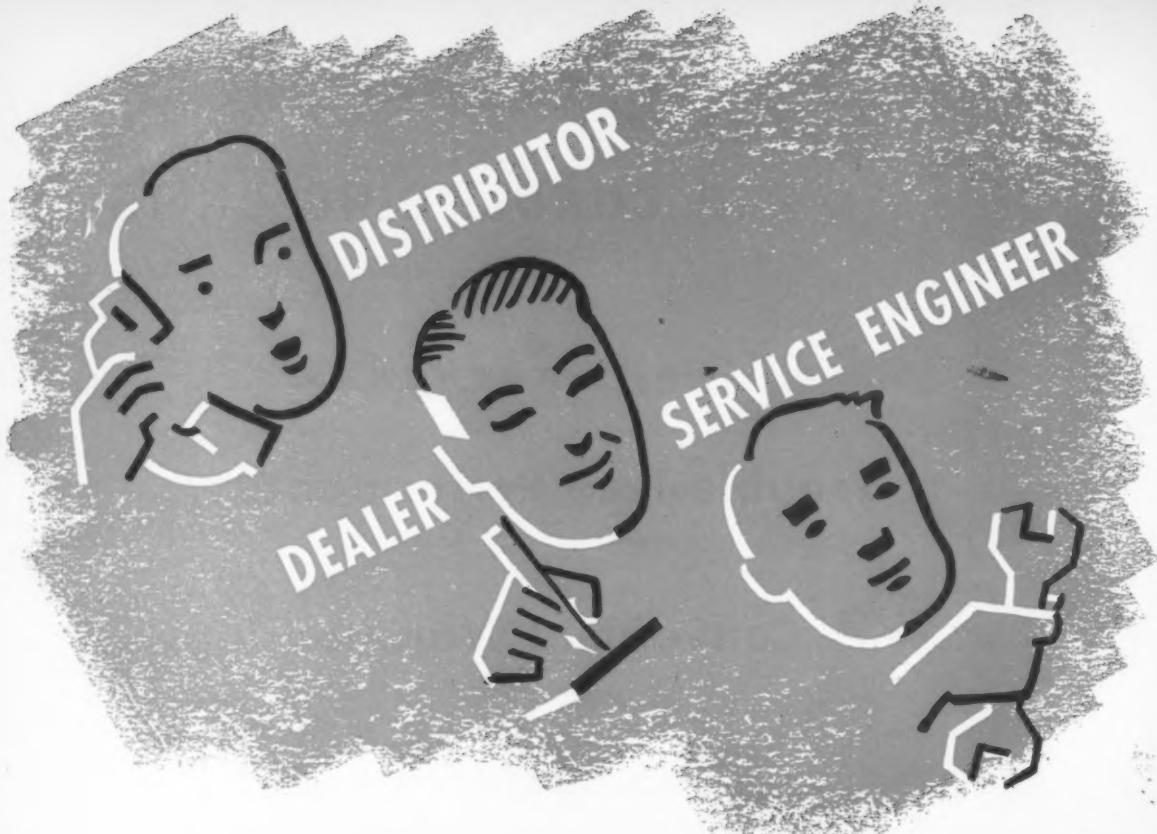
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AUGUST, 1946

# THE PRACTICAL Refrigeration Engineering MANUAL . . . by Harold Smith

## XIII. Bakery Refrigeration

### PART II

AS considerably higher relative humidity conditions exist in these fixtures, evaporators with proper load capacity based on 10° T.D. are usually selected. The condensing units should be set to run with off-cycles of sufficient length to completely defrost the evaporators on each cycle, and prevent any building up of ice with the resultant loss of refrigeration temperatures.

#### SELECT UNITS CAREFULLY

Condensing units with required capacity based on plus 25° suction gas temperature should be selected to do the work. Care should also be used in choosing the location for the condensing units on all bakery installations.

Because of the great oven heat, frequently little artificial heat is employed in bakeries during the winter, resulting in cold basements and often cold storage rooms. If water-cooled type condensing units are used, care must be taken to locate these units where the temperature will not fall below freezing in the winter.

#### LOW TEMPERATURE THREAT

If air-cooled units are used, cool basement conditions are usually ideal for efficient operation, summer and winter. However, if the surrounding temperatures become extremely low in winter, provisions may be required to control the operating cycles of the condensing unit by thermostats in place of pressure controls.

This is because the low temperatures will sometimes condense the returning hot gas when it reaches the cold condensing

unit and not build up enough pressure to start the machine in operation, resulting in an unsatisfactory temperature rise in the fixtures.

#### WATCH UNIT LOCATION

If, on the other hand, air-cooled type condensing units are used and are installed in the production area of the bakery, subject to high surrounding air temperatures of plus 85° F. and up, summer and winter, a great deal of efficiency will be lost; condensing units will labor under high head pressures and resulting long operating cycles.

If air-cooled condensing units must be installed under these high temperature conditions, allowances must be made for the resulting loss in efficiency, and larger capacity condensing units must be selected to handle the loads under these unfavorable conditions.

#### WATER COOLING JOB

Refrigeration requirements for the production part of bakery operation cover water cooling and air conditioning. The water cooling operation is the job most frequently handled, particularly in the smaller bakeries.

Water is cooled to a temperature as close to 33° F. as possible. This water is mixed with the flour in a mixing machine to produce the various doughs for the numerous bakery products.

Water coolers of the instantaneous type or the tank type can be used. The instantaneous type is rapidly replacing in popularity the tank type equipment, because considerably less space is required for the equipment; also water can be cooled to the required temperature much more quickly and efficiently.

## YORKVILLE PAPER NAMES REGIONAL AGENTS

In furtherance of its plan to gain distribution of packaging materials for home and farm freezing through distributors and dealers handling this type of refrigeration equipment, Yorkville Paper Co., Inc., has named several new regional representatives. These factory agents, and the territories they will cover, follow:

S. O'Keeffe—New York, Pennsylvania,

New Jersey; Irving H. Cohler—Illinois, Wisconsin, Minnesota, Iowa; T. J. McEntire—California, Arizona, Washington, Oregon, Nevada; W. T. Fyler—Florida, Georgia, North Carolina, South Carolina; H. B. Weeks—Maine, Massachusetts, Vermont, New Hampshire, Rhode Island, Connecticut.

Al O. Stein—Virginia, West Virginia, Maryland, Delaware, Louisiana, Mississippi, Tennessee, Alabama, Arkansas; Sam C. Mitchell—Missouri, Kansas, Nebraska, Oklahoma; A. J. Nelson—North Dakota, South Dakota, New Mexico, Montana, Idaho, Utah, Colorado, Wyoming; E. A. Bradford—Texas, Oklahoma; R. H. Zeigler—Indiana, Ohio, Kentucky, Michigan.

Automatic and instantaneous water coolers are manufactured and sold self-contained, except for the condensing unit. All necessary valves, gauges, evaporators and thermostats are usually built into the unit.

### INSTALLING WATER TANKS

The water tank is insulated, so the unit may be set in a warm room if necessary. Because of the complete assembly of the unit the installation of the equipment is a relatively small item, consisting of lines to connect supply water into the units and furnished cold water to the mixers or to other points where the water is to be used. A water line for the purpose of occasional draining of the water storage tank is usually installed.

The refrigeration liquid and suction lines are connected to the unit, the expansion valve is connected, and the installation to the unit is complete.

The condensing unit can be installed in any satisfactory location close to the unit or at any other desirable location. Manufacturers of instantaneous water coolers provide capacity ratings on their equipment, based on water temperatures in and out of the unit and in gallons per hour.

The engineer must learn the inlet water temperatures, the temperature desire for cooling, and the number of gallons per hour to be used. With this information the proper capacity unit can be quickly selected by referring to the manufacturer's rating charts.

### WATER TANK OPERATION

If the tank-type unit is to be used, an insulated tank with metal, water-tight lining or tank inside and with lids that can be removed for inspection or repairs is used. The water is supplied to the tank usually through a valve controlled by a float ball which controls the water level within the tank.

As water is used, replacement water is brought in to maintain a fixed volume within the tank. The evaporators, usually consisting of plate coils or coils made of continuous tinned tubing or pipe, are submerged in the water.

It is considered good practice to construct circulation baffles within the tank, and sometimes an agitator is used to circulate the water rapidly and increase the cooling operation. The cold water is usually taken from the bottom of the tank, and flows either by gravity or through the use of a water pump. With most tank-type coolers a fluctuation of water temperatures is experienced, particularly towards the end of a long water usage run.

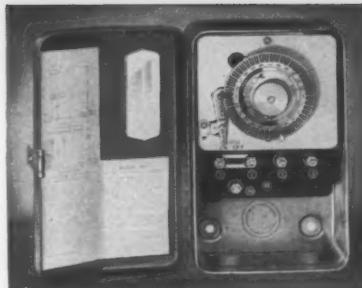
### CONSTRUCTION WORK NEEDED

One advantage of the tank-type system is that the water in the tank can be cooled during the period when the bakery is not in operation, and smaller condensing units can be used to cool the water, over a longer period of time. This, however, would be of advantage only to bakeries operating eight or ten hours a day, and would not work out well in bakeries operating throughout a 24-hour period.

The great amount of construction and assembly work required to put together a tank-type cooler results usually in a comparatively expensive installation. The manufacturers of the instantaneous type cooler incorporate all the assembly work in their manufacturing plants on a production basis, enabling them to produce a complete unit quickly and at a lower price.

Another problem with tank-type equipment is the need for experienced and careful engineering. It is very important to properly engineer each tank-type installation with the maximum care and skill to definitely provide the correct volume of cold water required.

(To be continued next month)



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THE air conditioning machinery in pre-war use in some of the nation's largest mercantile establishments is "back home" again this summer after having spent the past couple of years in government service.

Back in 1943, when refrigerating equipment was desperately needed for the speeding up of synthetic rubber and aircraft motor production, the War Production Board made arrangements to "borrow" this equipment from several large users and apply it to military purposes. At the time the equipment was "drafted" for war uses, postwar replacement priorities were guaranteed the shops making the sacrifice.

The stores which made the loans of their air conditioning equipment originally, and in which re-installations are now being made, include Tiffany & Co., Gimbel's, Lord & Taylor and McCreery's, of New York City; Marshall Field & Co., Chicago; Fox & Co., Hartford, Conn.; Famous-Barr, St. Louis; J. L. Hudson Co., Detroit; the Municipal Auditorium, New Orleans, and Sears, Roebuck & Co., Washington, D. C.

Carrier Corp.'s report that the air conditioning equipment is being replaced is the first public explanation of why, in 1944 and 1945, it was not "cooler inside" these stores in the summer months.

#### DRIERITE CO. MOVES

W. A. Hammond Drierite Co., producer of dehydrating materials, is now in a new location at 120 Dayton Ave., Xenia, Ohio. Former location of the company was at 108 Dayton St., Yellow Springs, Ohio.

Engineering Co., Tulsa, Okla., eastern Oklahoma; Atlantic Engineering Co., Greensboro, N. C., the northwest corner of North Carolina.

#### NEW YORK DISTRIBUTORS

Three new distributors have been appointed by York Corp. These new outlets, and the territories they will serve, are: Grahame Sales, Yorkville, N. Y., central New York State; Acme

#### NEW SERVICE FIRM

Wescott & Walter Refrigeration Equipment, Inc., Fort Lauderdale, Fla., has been granted a charter of incorporation as a refrigeration service firm with 200 shares of \$100 par value stock. Incorporators are: Harold S. Wescott, J. Frank Walter, and Francis A. Wescott.

*Let's talk about Hot Air!*

**THAWZONE DATA**

It is difficult, if not impossible, to remove all traces of air from field-installed refrigerating systems, and from factory assembled units too. Residual air in a system in large amounts causes high head-pressure, but small amounts are not detectable by increased head-pressure. These smaller amounts, however, are the cause of serious trouble in refrigerating systems.

This air is HOT AIR. It traps in the condenser, where it is held at temperatures up to 200°F or higher. At these temperatures the oxygen of the air is very reactive. It is in contact with small amounts of oil as well as refrigerant, and oxidizes them to compounds known as organic peroxides and acids. These compounds are corrosive and attack metals and form sludges.

**THAWZONE**  
Fully Protected by U. S. Patent  
The PIONEER FLUID DEHYDRANT

Entirely separate from its function as a moisture remover, THAWZONE is also a very effective oxygen scavenger. It not only has a catalytic effect in preventing oxidation of the oil—an inhibitor action—but it also effectively removes oxygen. THAWZONE "grabs" the oxygen before the oil does, and is converted to oil-soluble, non-corrosive, inert-reaction products of a type known chemically as aldol condensation products.

Many refrigeration troubles, commonly ascribed to moisture, are really due to air. THAWZONE effectiveness has helped refrigeration engineers for years.

**HIGHSIDE CHEMICALS CO.**  
195 VERONA AVE. NEWARK 4, N. J.



WESTERN THERMAL EQUIPMENT CO.  
1701 W. Slauson Ave., Los Angeles 44, Calif.



Sockets are the most used tools in a mechanic's kit because when used with various types of handles and attachments, they can do almost any nut-turning job. But inferior sockets are little better than nothing.

Sockets to be good must have just the right combination of hardness and toughness to provide longest wear and greatest

strength. Bonney "Case-Toughened" Sockets provide just the right combination—hard enough to resist wear yet tough enough to resist breakage.

If you have not tried Bonney Sockets, stop in at your nearby Bonney Jobber and ask him to show you these long wearing Sockets that are the first choice of many mechanics.



**BONNEY FORGE & TOOL WORKS • 719 N. MEADOW ST. • ALLENTOWN, PA.**

In Canada: Gray-Bonney Tool Company, Ltd., St. Clarens & Royce Aves., Toronto

"Let's share our knowledge—exchange our experience!"

# Heres' how

## THE SERVICE MAN'S DEPARTMENT

### Help Your Customers Get Better Service

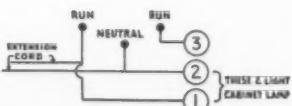
You can help your customers get top-grade efficiency from their refrigeration equipment this summer, and spare yourself plenty of minor service calls, if you will remember to give your users a few tips on taking care of the three principal parts of the

HERE is a quick way to determine the hook-up for electric motor using three-lead cord to the cabinet.

Before making the test, however, be sure to have the switch in the OFF position.

Here's what to do:

1. Plug in extension cord, holding leads in hand; in the other



hand, hold the three cabinet leads, separated. Touch all leads in turn until the light in the cabinet goes on.

2. Place the third lead, which is not connected to the light, on one running terminal of the motor.

3. Check to see that the light does not shut off when the motor does, or vice versa. If first arrangement is not satisfactory, reverse No. 1 and No. 2 leads.

*Joe Gerson, Jackson, Tenn.*

system: compressor, condenser and evaporator.

1. *The motor should be oiled regularly.* There are two oil cups on the motor, and a few drops of oil should be added every two to four months. In larger jobs equipped with forced-draft units, motors on these units also require regular oiling.

Edited by  
Warren W. Farr

2. *Check the motor-compressor belt.* A frayed belt usually indicates poor alignment of motor pulley and flywheel. This causes slippage, and cuts down efficiency. Worn belts are potential trouble sources; replace them.

3. *Keep condenser coils and fins clean.* A dirty condenser makes the compressor work harder, wastes electricity.

4. *Defrost the evaporator regularly.* Frost over one-eighth inch thick cuts down operating efficiency. Keep the evaporator cleaned of frost so it can do its best work.

HAVING had trouble with the small hole to the bellows connection becoming plugged on high-pressure, low pressure, and water valves, I now make the connection in the following manner:

First, the bellows fitting is drilled out with a No. 54 drill; then the bellows connection is made with a three-foot length of capillary tubing with a four-inch piece of  $\frac{1}{4}$ " tubing, silver soldered to each end for standard flare connections.

*V. P. Johnston, Wheaton, Ill.*

### Help the Customer Store His Foods Properly

Do your commercial customers understand how to load their refrigerators properly? You can build some valuable good will by checking into this and giving them the correct information, in case they're not sure.

Here are some things you can tell them:

Merely placing food in a refrigerator doesn't assure it the best possible

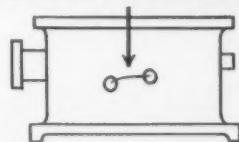
protection. Different foods require different temperatures for proper preservation.

The evaporator, naturally, is the coldest spot—and should be used for foods that require coldest storage, frozen foods for example.

Right below it is the best spot for fruit juices and other beverages, meats, and fish. The bottom shelves

WHENEVER I have to repair a crack in a crancase or similar casting, I proceed as follows:

Drill two holes through the casting, one at each end of the crack.



Tap these holes and screw in a brass bolt and cut off flush.

Using a diamond point chisel, widen out the crack. Then file the whole preparation clean and braze or silver solder an area extending about  $\frac{1}{4}$ " past the limits of the area worked on.

*E. A. Wenk, New York City*

are best for most fruits and vegetables.

On the side of the refrigerator opposite the section in which the evaporator is located, the top shelf is best for storage of milk. Eggs also should be kept in this general area, but away from the cooling unit itself. Butter should be kept on the lower shelves of this section, where the temperature may be slightly higher than in the other section.

### Temperature Difference

Can you give some information on temperature difference and how to



## Better be SAFE with a CESCO Mask

• Don't take chances with hazardous refrigeration fumes. There's a way to be safe—use a CESCO Healthguard Mask.

**No. 605 FUME KIT**  
gives 3-way protection at lower cost



CESCO's Healthguard Fume Kit (No. 605) offers *triple protection* to refrigeration servicemen. Quick-change filter cartridges assure safety against ammonia, methyl-chloride and sulphur-dioxide fumes . . . *all in one convenient carrying case*.

The soft molded rubber face-piece of the fume mask, and the adjustable headgear assure a gastight, comfortable fit for every wearer. Large safety glass lenses give perfect visibility.

The CESCO Healthguard Kit provides *economical* protection because it is *moderately* priced.

*Write for CESCO'S No. 605 Safety Bulletin for complete information*

**CHICAGO EYE SHIELD CO.**

2340 Warren Boulevard  
Chicago 12, Illinois



**CESCO**  
FOR SAFETY

figure proper gas temperatures?

A. In most applications humidity is a factor to be considered as well as temperatures and this will influence the selection of equipment. Broadly speaking, a 10° temperature difference (between coil and fixture) gives high relative humidity; A 15° T.D.—medium or average relative humidity; 20° T.D.—low humidity.

**T**O GAUGE the oil level in a compressor crankcase (especially the ones with very small oil ports), I use a gray coated electric welding rod. It can be used and wiped off dozens of times and still give an easy and accurate reading. *John Tronza, New Kensington, Pa.*

### Shelf Freezer Plates

*What is the construction of shelf freezer plates? Are they filled with brine?*

A. The construction of shelf freezer plates are identical with those used for overhead cooling. They are not filled with brine as there is no need for hold-over. Freezer plates that are filled with brine, usually called eutectic, are designed for ap-

MUCH of the trouble in Coldspot units is due to plugged oil lines. The method for removing the sludge can be simplified after the machine is disassembled, by making



a fitting as follows from an ordinary  $1/4$  SAE to  $1/4$  IPT half union.

File IPT end until it is  $5/16$ " round; then cut new threads on with a  $5/16$  SAE die. Insert the  $5/16$ " threaded end in the oil line after removing the screen.

Carbon tetrachloride can be poured in with an eye-dropper and blown out with methyl chloride or dry air. You will be surprised with the results. Don't forget to clean the oil ways out in the compressor ring also.

*J. C. Robinson, McKeesport, Pa.*

plications where condensing unit operation is off or not available for several hours such as gas engine drive of refrigerated trucks.

### Inner Condenser Tubes

*Why do the inside tubes of a water-cooled condenser collapse whether the tube is refrigerant or water?*

A. The collapse of the water tube inside a condenser is due to excessive refrigerant pressure. This condition can only exist when the receiver is full of liquid, particularly on a multiple low side installation. Refrigeration vapor alone is not sufficient to collapse tubing.

### FIVE DOLLARS REWARD

**W**ILL be paid by  
The Refrigeration Industry  
for any information on installation or servicing procedures and short-cuts accepted for publication in its HERE'S HOW department.

Send your suggestions on shop equipment and methods, tools, or other ideas to

**HERE'S HOW EDITOR**  
THE  
REFRIGERATION INDUSTRY  
1240 ONTARIO STREET  
CLEVELAND 13, OHIO

## AMINCO OIL SEPARATORS



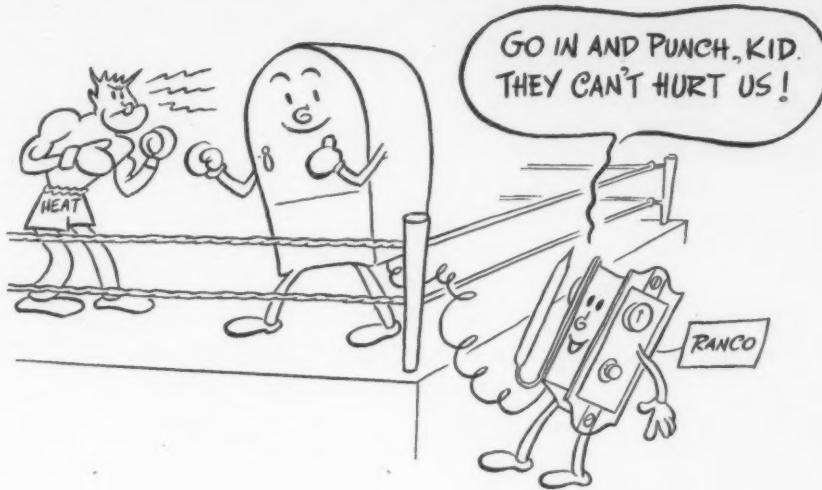
Aminco Oil Separators protect compressors by maintaining correct oil level in crankcase and by excluding oil from refrigerant stream they enable coils, condensers, valves and dehydrators to function most efficiently.

These oil separators are made for jobs from  $1/2$  H.P. to 120 tons and are used everywhere, ashore or afloat, where efficient refrigeration is desired.

Full descriptive bulletins on request.

### AMERICAN INJECTOR CO.

1481 - 14th AVE. DETROIT 16, MICH.  
Van D. Clothier, 1915 E. 10th, Los Angeles  
George J. Boone, Rm. 730, 1775 Broadway,  
New York  
W. H. Cody, Santa Fe Bldg., Dallas  
Export: Borg-Warner, 310 So. Mich., Chicago

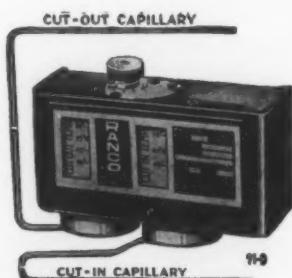


## Ranco's in YOUR Corner

So Old Hard-Hitting Heat can't hurt your customers—not with Ranco Refrigeration Control protection.

The thermometer can "blow its top" without affecting Ranco Controls' accurate maintenance of uniform temperature with high relative humidity. And, too, Ranco Controls assure completely automatic defrosting regardless of weather or load conditions.

Ranco's skilled machinists, accustomed to working at close tolerance, inspect each part for precision in every step of construction . . . this is your insurance and Ranco's guarantee of perfection in operation.



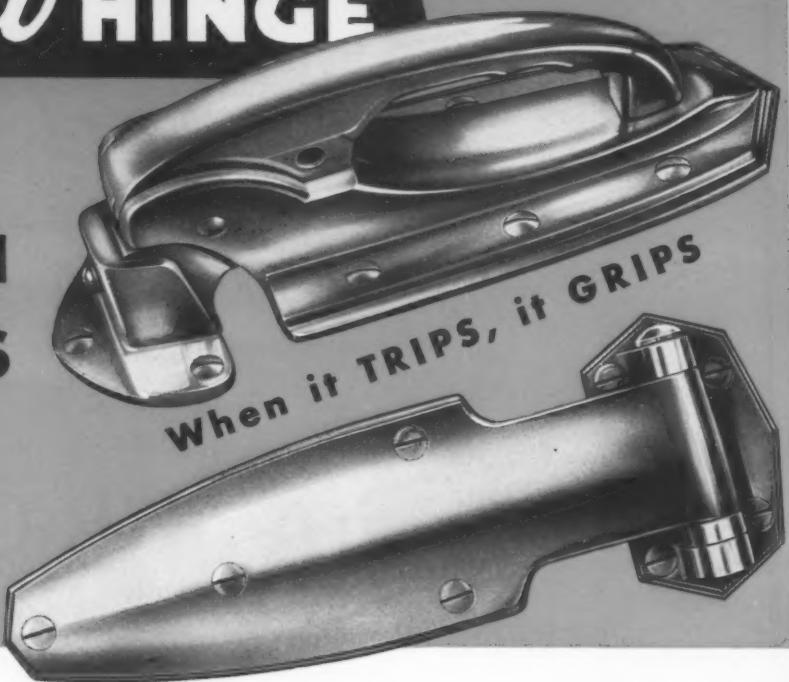
Service men who want the best in performance and long life ask their jobbers for Ranco Controls. Detailed information on any control furnished on request.

*Ranco Inc.*

COLUMBUS 1, OHIO

# A New LOCK A New HINGE

For  
**WALK-IN  
COOLERS**



## NOW AVAILABLE FROM AMERICA'S QUALITY MAKER OF COMMERCIAL REFRIGERATION HARDWARE

"Husky" is a mild word for this big lock. It's engineered and built for the heaviest kind of duty. The locking principle is our patented "When it trips, it grips" mechanism. Saves door-slamming . . . goes into action with finger-tip pressure. Then it takes hold with a constant, bulldog grip that seals the weightiest door. With all its massive power, it's a beautiful stream-lined job . . . finished in top-quality chrome that gleams like a mirror.

The reversible ball-bearing hinge is a worthy companion. Full specifications and prices on application. Order now for early delivery!

### S P E C I F I C A T I O N S

**No. 4774 Reversible Automatic Lock.** Forged brass handle, extruded brass bolt, stainless steel pins, case of our special zinc alloy die-cast under hydraulic pressure.

**No. 3913 Reversible Strike.** Pressure-cast zinc alloy base, cast brass nose. Offsets adjustable from  $\frac{3}{4}$ " to  $1\frac{3}{8}$ ". Overall length (lock and strike),  $12\frac{1}{4}$ ".

**No. 4552 Push Rod Assembly** for interior operation available on order.

**No. 15375 Ball Bearing Reversible Hinge** of forged brass. Offsets from 1" to  $1\frac{1}{4}$ ". Overall length,  $12\frac{3}{4}$ ".

*Manufacturing a full line of hardware for commercial refrigerators*

**Grand Rapids Brass Company**  
Division of CRAMPTON MANUFACTURING COMPANY  
Grand Rapids 4, Michigan

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chance to tell  
you more about  
these 3 important  
"Lehigh" features

### INTERCHANGEABLE PARTS

Service parts are interchangeable from  $\frac{1}{4}$  to 1 H.P. and from  $1\frac{1}{2}$  to 5 H.P.

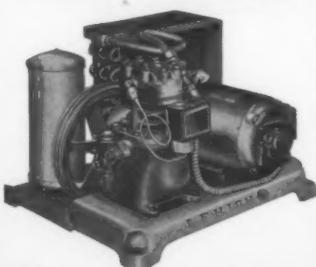
### SMALLER INVENTORY REQUIREMENTS

Less capital investment—small stock covers all requirements.

### HEAVY DUTY USES WITH COMPACT SIZE

Exceptional power from small size units—due to major mechanical improvements.

Data Sheets and General  
Information Gladly Mailed



Illustrating  
 $\frac{1}{2}$  H.P.



REFRIGERATION DIVISION

**Lehigh**  
**FOUNDRIES, Inc.**  
Plant: LANCASTER, PA.

# CONTRACTORS

News • Activities • Plans

### ED WRIGHT IN SPECIAL FIELD WORK FOR N.A.R.C.

E. S. Wright of Youngstown, Ohio, one of the organizers of the National Association of Refrigeration Contractors (NARC) and its present recording secretary, has agreed to give a portion of his time as a special representative of the association in the field.

Mr. Wright's services will be available for local meetings or conferences of refrigeration contractors in the central, south-central and eastern states.

Mr. Wright got his start in the refrigeration industry by selling refrigerators and worked his way up to the position of sales manager of a large distributor.

He finally decided to go into business for himself, and organized a refrigeration service business in Youngstown, featuring a contract service under a bonded guarantee, and specializing in commercial and industrial refrigeration and air conditioning sales, installation, and service.

At present, Mr. Wright is president of Refrigeration Contractors, Inc.,



Mr. Wright

and vice-president of Zero Locker Co., with plants in Youngstown and Warren, Ohio. He also acts as consultant on special sales application and engineering work for other refrigeration contractors.

He has designed and built many systems for hospitals, dairies, restaurants, packing houses, and industrial plants, including 23 cold storage plants.

In meeting with local groups, he is prepared to discuss their problems and needs, what they can do by working together, and what NARC can do for them—all for the purpose of helping to make refrigeration contracting a better, cleaner and more profitable business.

Requests for his services with tentative dates should be made to National Association of Refrigeration Contractors, 353 Hippodrome Annex, Cleveland 15, Ohio.

### CONTRACTORS ORGANIZE IN WESTERN N. Y.

Officers of the Refrigeration Contractors Association of Western New York, recently organized at a meeting in Hotel Lafayette, Buffalo, are:

David Zimmerman, chairman; Max Rosen, vice chairman; Ralph Davis, secretary; Howard Hornung, treasurer.

### WIDER FREON USAGE ALLOWED BY N.Y. CODE

Regulations governing the use of Freon refrigerants have been altered by the New York City Fire Department to permit the use of Freon-21, Freon-22 and Freon-113. Heretofore only Freon-11, Freon-12 and Freon-114 were permitted.

The changes became effective recently with the issuance of Circular No. 2 by Frank J. Quayle, New York City fire commissioner.

A number of restrictions regarding the applications of these refrigerants still apply, however. While the circular states that the six refrigerants mentioned are "non-flammable and non-irritant", the Fire Department



# NU-COIL

(CONCENTRATED)

## COIL CLEANER

**NO OBJECTIONAL ODOR**  
**UTMOST IN LABOR SAVING**  
**CAN BE USED OVER**  
**REPEATEDLY**  
**OFTEN IMITATED**  
**IS SIMPLE TO APPLY**  
**LET YOUR REFRIGERATION**  
**WHOLESALE EXPLAIN—**  
**NOW**

**SKASOL CORPORATION**  
112 GLENCOE AVE. WEBSTER GROVES 19, MISSOURI

rules that "when use in a room or rooms in which there is an open flame or apparatus to produce an open flame, then the provisions of said article covering irritant refrigerants shall apply."

The ruling also requires that "systems containing more than six (6) pounds of Freon-12 or Freon-113 be confined to separate machinery rooms in accordance with Section C19-99a, Administrative Code."

It is suggested that refrigeration and air conditioning men whose operations might come under the revised requirements obtain a copy of Circular No. 2 to become fully acquainted with the changes.

### ARIZONA CONTRACTORS JOIN NATIONAL GROUP

The Arizona Refrigeration Association, with headquarters in Phoenix, Ariz., has joined the National Association of Refrigeration Contractors, reports NARC headquarters in Cleveland. Thirty-one firms are members of the group. Officers of the Arizona association are G. W. Lance, president; Forest Barka, vice president; Orrin Hodges, secretary-treasurer.

**NOW!**

**FORGED FLARE NUTS  
AND FITTINGS**

**Complete Stock**

**Prompt Shipment**

**Electrimatic**

2100 INDIANA AVE  
CHICAGO 16 ILLINOIS

**NATIONAL** Bureau of Standards has released a new Commercial Standard CS-131-46 on "Industrial Mineral Wool Products, All Types—Testing and Reporting." This is the third standard to be released in a series produced through collaboration of the National Bureau of Standards with the Industrial Mineral Wool Institute.

The new standard permits industry-wide bases of judgment and specification in mineral wool insulation products. Tests described are for all material of fibrous form processed from molten rock, slag, or glass. The types of mineral wool insulation for which tests have been standardized are blanket, block, board, felt, granulated, industrial batt, insulating cement, loose, and pipe insulation of both blanket and molded forms.

Methods of testing, and methods of reporting established standards, are given for compressive strength, corrosion resistance, density and thickness, fire resistance, moisture adsorption, odor emission, shot content (non-fibrous content), temperature resistance, and thermal conductivity of various forms of mineral wool insulating material. Tests for adhesive strength and coverage are given for mineral wool insulating cement, other tests being inappropriate to this form.

Copies of the new standard (CS-131-46) may be had from the Industrial Mineral Wool Institute, 441 Lexington Ave., New York 17, N. Y.

**PHEASANT FREEZING . . .**  
Continued from page 23

and frying pheasant will be on the opposite side of the box. These individual cartons will make it possible for the lodge to arrange for a more convenient shipping carton.

Ray Kromer, as we said previously, is first of all a refrigeration man. He was national director of the National Refrigeration Training Program during the war years, and it was under his leadership that the refrigeration industry won its battle for recognition as an essential occupation from

**A**MERICAN SPORTING GOODS CO., St. Louis, has undertaken the merchandising of home freezers specifically for sale to sportsmen, whom it believes will provide a market both ready and steady.

Hunters and fishermen preparing for a trip, the store has found, listen readily to any suggestion that will make their trips more enjoyable. "While we're outfitting a hunter or fisherman for his trip," says Harold Stevens of the store, "we automatically ask what he intends to do with his bag or catch.

"Most men, of course, say that they intend to take it to a locker or cold storage plant—which gives us an opportunity to point out the advantages of a home freezer, useful for year-round food storage as well as for such special uses as this."

Several units already have been sold by the company, which plans to offer a variety of makes, priced in general around \$500.

the War Manpower Commission. More recently he has been actively interested in activities leading to formation of the National Association of Refrigeration Contractors.

Temporarily, he is out of the refrigeration contracting field, but, in his own words, he is "looking forward to the time when I will again be selling refrigeration jobs." In the meantime, he is devoting his time to the operation of his Ring Neck Lodge enterprise, which (he says) "started out as a hobby and is ending up as a nice business."

**SPORLAN VALVE MOVES  
ITS EASTERN OFFICE**

To provide larger facilities for the expanding eastern territory, Sporlan Valve Co. on July 1 moved its eastern office to 1 Stevens Ave., Mt. Vernon, N. Y. The office is staffed by C. C. Grote, J. T. Barry and W. A. Reichenbach.

**QUICKEE** the new  
**HAND CLEANER**  
that removes **GREASE, GRIME, PAINT**  
without the use of water!



Gentle. Quick acting, with Lanolin and Vegetable Oils. Prevents chapping. Not injurious to skin.....

**TRY IT YOURSELF!**

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**DIVISION OF AMERICAN MACHINE AND METALS, INC.**

**SELLERSVILLE, PENNSYLVANIA (1)**

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# The MARKET Place

### SALES MANAGER WANTED

Refrigeration Sales Manager wanted by parts jobber, Middle Atlantic Seaboard. Good Salary, bonus and possible interest in business for thoroughly experienced man with manufacturer connections. Fine opportunity. Replies treated as confidential. Box 8146, Refrigeration Industry.

### FOR SALE

FOR SALE—Air-cooled & water-cooled, remanufactured condensing units,  $\frac{1}{4}$  up to 2 H.P. Write for particulars, Edison Cooling Corp., 310 East 149 St., Bronx 51, N. Y.

We buy, sell and trade household and commercial refrigeration compressors and surplus equipment. Give complete details. Have Bargains, Want Bargains. Write Myers Electric—Manitowoc, Wis.

Bank of new ammonia 1" coils welded with short return bends fit tank 15" x 24" x 9 $\frac{1}{2}$ ". \$300.00.

Vilter Horizontal Compressor 7x14 with wall type Condenser and all fittings except motor, \$1000.00. Box 7346, Refrigeration Industry.

FOR SALE—Aluminum blades for Cold-spot compressors, 25 cents each; send sample. Searling Repair Co., 1869 Flatbush Ave., Brooklyn 10, N. Y.

### EQUIPMENT WANTED

Wanted 12 Dry Ice Plants for the manufacture of  $\text{CO}_2$  gas and solids, capacity 1 to 2 tons. Please apply to Dry Ice Utilizing Co., Ujjain (India).

INCREASED use of open-type refrigerated display cases has been advocated by the New York State Food Merchants Association after conducting tests to determine the advisability of merchandising pre-packaged goods. When the produce is handled in this way, the association claims, the entire packaging process can be handled at the warehouse for daily delivery in refrigerated trucks.

# STANDARD

## Prime Surface COLD PLATES

For Maximum  
Refrigerating Efficiency



### THE STANDARD-DICKERSON CORP.

46-76 Oliver Street • Newark 5, N.J.

STANDARD KNOWS REFRIGERATION

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On your next service call...  
put on  
"TRAP-DRI" first!



You'll avoid expensive call-backs later!



DRIER-FILTER-STRAINER

- ✓ Traps all impurities in your system.
- ✓ As effective as a 900-mesh strainer — yet offers no appreciable pressure drop.
- ✓ Silica Gel takes up to 12 to 16 per cent of its weight—more than other drying agents.
- ✓ Acts instantly — not affected by oil in system — give up no dust of powder.
- ✓ Three sizes —  $\frac{1}{2}$ ,  $\frac{1}{4}$ , and 1 ton.
- ✓ May be used with Freon, Methyl, Sulphur



This A-P "TRAP-DRI" Drier-Filter-Strainer ahead of your expansion valve is a great service time-saver on any system! You get smoother, trouble-free valve operation, prevent freeze-ups, clean up your refrigerant line in a jiffy!

Once on the line, a "TRAP-DRI" starts immediately cleaning out all gummy deposits, scale, dirt, and solder particles. And moisture or acids in the system are quickly absorbed by the efficient charge of Silica Gel. Gives you "100% protection" against system impurities.

Make the A-P "TRAP-DRI" system-protector a *must* on every job. It saves trouble, time, money later.

Stocked by leading refrigeration parts jobbers. For details, write for bulletin No. 107

why every system needs "TRAP-DRI"

This heavy deposit of impurities was removed from a new-system by an A-P "Trap-Dri" similar to "Trap-Dri" but without Silica Gel.



AUTOMATIC PRODUCTS COMPANY

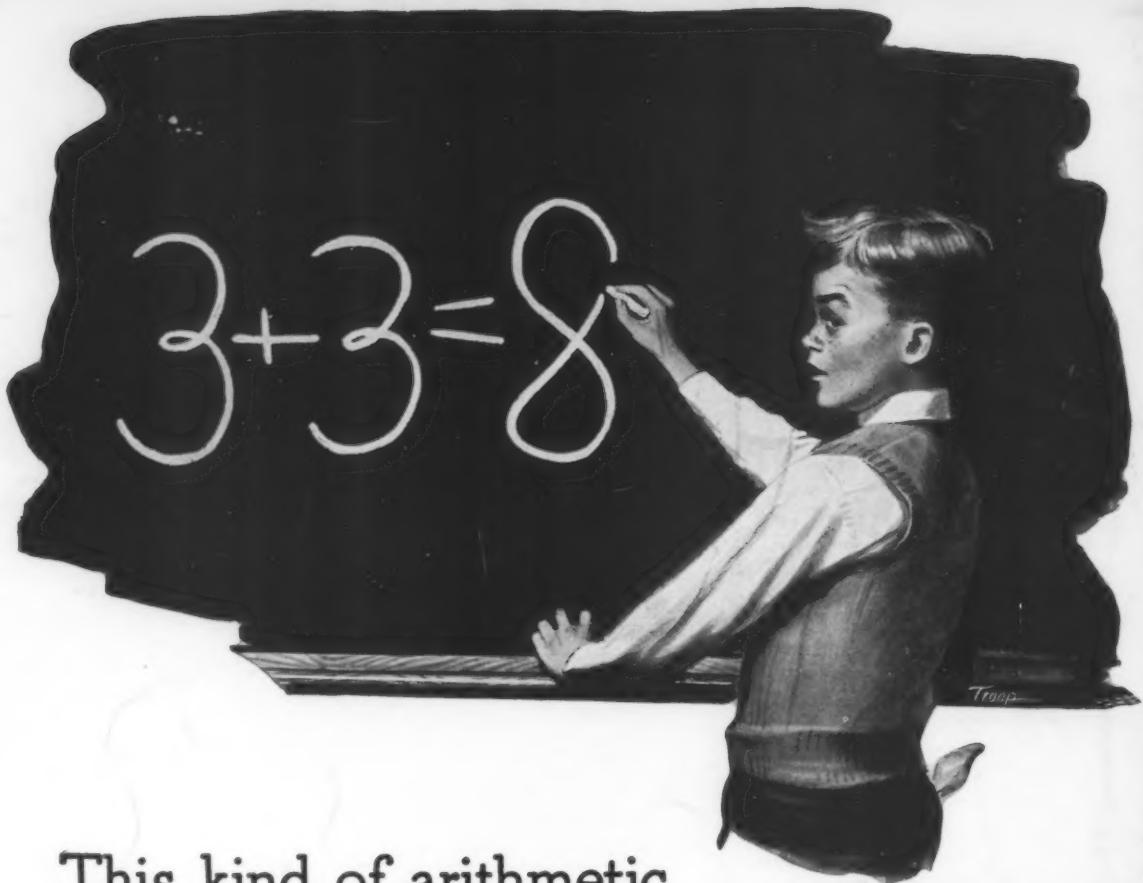
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## This kind of arithmetic may put Johnny through college

Here's how it works out:

**\$3 put into U. S. Savings Bonds today will  
bring back \$4 in 10 years.**

**Another \$3 will bring back another \$4.**

So it's quite right to figure that 3 plus 3 equals 8 . . . or 30 plus 30 equals 80 . . . or 300 plus 300 equals 800!

It will . . . in U. S. Savings Bonds. And those

bonds may very well be the means of helping you educate your children as you'd like to have them educated.

So keep on buying Savings Bonds—available at banks and post offices. Or the way that millions have found easiest and surest—through Payroll Savings. Hold on to all you've bought.

You'll be mighty glad you did . . . 10 years from now!

**SAVE THE EASY WAY... BUY YOUR BONDS THROUGH PAYROLL SAVINGS**

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